# Patient experiences in rural Northern Ontario: Small hospital utilization and perspectives on community paramedicine

by

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# Abstract

This thesis adhered to an integrated article format with two distinct studies focusing on the analysis of patient medical records from a rural hospital in north east Ontario (Study 1) and a cross-sectional observational investigation of patient perspectives on community paramedicine (CP) (Study 2). The aim of Study 1 was to help hospital administrators identify patients at high risk of frequent hospital resource utilization (emergency department (ED) visit or admissions) so that if appropriate, they may be redirected to alternative services available in the community. Therefore, the two main research questions for this study were: (1) Which types of patients are more prone to having repeat ED visits and hospital admissions; and (2) What types of services could better serve or help improve the health of these patients? Study 2 aimed to evaluate patient and caregiver perspectives related to their involvement in three CP programs in rural communities across Northern Ontario. There were two research questions guiding the evaluation of patient perspectives in this study: (1) How effective is CP at supporting patient-centered care; and (2) How do perceptions differ between home visit (HV) and wellness clinic (WC) patients? In Study 1, twenty-six patients met the criteria for repeat ED visits (65% female; mean age 52 years) and accounted for a total of 623 ED visits. Seventeen patients met the criteria for repeat admissions (41.2% female; mean age 73 years) and accounted for 69 repeat hospital admissions. The most common reason cited for repeat ED visits was dressing changes and the most common reason cited for repeat admissions was chronic obstructive pulmonary disease. For Study 2, 91.7% (n=55) of patients reported

being satisfied with the CP services they received and 98.3% (n=59) of the patients indicated that they would recommend CP to others. Patient perspectives of CP suggest that the service model is consistent with a patient-centered framework that includes interpersonal, psychosocial, clinical, and structural dimensions. The patients also valued CP for the ease of access and the reassurance provided by the paramedics monitoring their health concerns. Our studies found that an older population with increased health needs appear acceptable towards receiving alternative health care services outside of the hospital. Based on the perspectives of patients currently enrolled in CP programs across Northern Ontario, the HV and WC services of CP appeared to be considered as an acceptable program that can provide patient-centered care in rural and northern communities. Collectively, these two studies provide important data related to the patient experience in a rural and northern health care system context. These are encouraging signs that alternative health care services, like the CP programs, can address non-urgent issues for residents of northern and rural communities in Ontario.

**Keywords:** rural, northern, Ontario, emergency department, admission, repeat visit, paramedicine, patient-centered care, patient perspectives, emergency medical services

# Paper 1 Co-Authorship Statement

Chapters two (Paper 1) and three (Paper 2) were prepared as manuscripts for submission for publication respectively.

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**Author Contributions:**

Chad Prevost assisted with the conceptualization of the study, conducted data analyses and wrote the first draft of the manuscript.

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# List of Abbreviations

CCAC – Community Care Access Centre

CDPM – Chronic Disease Prevention and Management

CHAP-EMS – Community Health Assessment Program through Emergency Medical Services

CHF – Congestive Heart Failure

CKD – Chronic Kidney Disease

COPD – Chronic Obstructive Pulmonary Disease

CP – Community Paramedicine

CTBC – Consent to be Contacted

ED – Emergency Department

EMS – Emergency Medical Services

EMSCC – Emergency Medical Services Chiefs of Canada

HL – Health Link

HV – Home Visit

IRCP – International Roundtable on Community Paramedicine

LHIN – Local Health Integration Network

LLLW – Living Longer, Living Well: Report Submitted to the Minister of Health and Long-Term Care and the Minister Responsible for Seniors on Recommendations to Inform a Seniors Strategy for Ontario

MOHLTC – Ministry of Health and Long-Term Care

NE – North east

NW – North west

PCCF – Three Dimensions of Patient-Centered Care Framework

RPM – Remote Patient Monitoring

SRFH – Smooth Rock Falls Hospital

WC – Wellness Clinic

# Chapter 1

## 1. Introduction

Canada is known for its vast geography and large tracts of wilderness. Therefore, it is not surprising that 95 percent of Canada's land mass is classified as rural.[1] It is estimated that between 21 and 30 percent of all of Canada's population resides in rural, remote and northern communities,[1] while approximately 14% of Ontario's total population resides in rural areas.[2] Rural communities are also often characterized by having a high proportion of elderly citizens compared to urban areas.[3] As defined by the Rural and Northern Health Care Framework, rural communities in Ontario are "those with a population of less than 30,000 that are greater than 30 minutes away in travel time from a community with a population of more than 30,000" (p.8).[4] For this thesis, rural will be defined using the Rural and Northern Health Care Framework definition.

For many people residing in rural communities in Ontario, a hospital is their primary source of health care services, however these services may often be used inappropriately for non-urgent cases.[5] Thus, alternative measures should be explored to reduce emergency department (ED) misuse and ensure patients have access to other health care services available in the community.[5] The purpose of this thesis was to explore the experience of patients in rural Northern Ontario in terms of small hospital utilization and the provision of community paramedicine (CP) services.

## 1.1 Overview of the Health Status of Ontario Residents

### 1.1.1 Factors Influencing Health

Generally, the health of those residing in rural, remote and northern communities is poorer than those living in urban communities.[6] Canadians living in these regions experience more health care challenges compared to those living in urban cities.[6, 7] This poor health status in rural areas is often linked to a broad range of conditions, including but not limited to: personal, social, economic and environmental factors.[1] Thus, this poor health status can be linked to many of the social determinants of health such as: income and social status, employment and working conditions, education, personal health practices and physical environment. Previous studies have shown that those with lower levels of education face difficulties when accessing health care services and specialists.[3, 7-10] Poorer health status and access to services are also negative outcomes encountered by populations with lower incomes or a lower socio-economic status (SES).[3, 7, 8, 10, 11] Another study indicated that unemployed populations have greater chances of being hospitalized, when compared to individuals that are employed.[7] Data from the Local Health Integration Networks has been used to illustrate some of the differences in health services, as well as health status, in rural and Northern Ontario and Southern Ontario.[4]

### 1.1.2 Ontario Local Health Integration Networks

In Ontario, there are 14 Local Health Integration Networks (LHINs) that have the responsibility to organize and coordinate health care services to satisfy the needs of the local communities.[4] However, compared to the province of Ontario, the two Northern Ontario LHINs are still struggling to adequately foster health services for rural, remote and northern populations.[12,13] The setting for this thesis focuses on rural patient experiences in these two northern LHINs: the North East (NE) LHIN and the North West (NW) LHIN. In the NE LHIN and NW LHIN, the proportion of population aged 65 years or older is 16.4% and 14.0% respectively,[12, 13] and in both LHINs, this proportion of seniors is higher than the provincial average. In Table 1-1, population health profile characteristics are presented for the NE LHIN and NW LHIN, compared to the provincial average.[12, 13] In many cases, those residing in the NE and NW LHINs demonstrate poorer health characteristics. The percentage of those indicating a perceived health of very good or excellent in either of the two northern LHINs was lower than the provincial average of 60.4% (Table 1-1). Many negative health conditions such as obesity, being a current smoker, or a heavy alcohol drinker, are also higher in the NE LHIN and NW LHIN. Other factors, such as effectiveness of health care, death rates, medical resources, and living and working conditions also present challenges for those residing in the two northern LHINs.[12,13] The life expectancy at birth for the average Ontario resident is 81.5 years, however this decreases to 79.0 and 78.6 years for the NE LHIN and the NW LHIN respectively.

**Table 1-1 – Population health profile characteristics of the NE and NW LHINs**

| Health Profile Characteristic | Region | | |
|---|---|---|---|
| | NE LHIN | NW LHIN | Ontario Average |
| Perceived health, very good or excellent (%) | 56.3 | 57.4 | 60.4 |
| Perceived Mental health, very good or excellent (%) | 72.8 | 70.3 | 72.4 |
| Overweight or obese (%) | 59.9 | 62.1 | 52.6 |
| Current smoker, daily or occasional (%) | 26.0 | 21.9 | 19.2 |
| Heavy drinking (%) | 20.8 | 20.9 | 16.9 |
| Influenza immunization (%) | 36.4 | 34.5 | 32.0 |
| Regular medical doctor (%) | 84.1 | 84.3 | 91.1 |
| 30-day readmission rate for mental illness (%) | 12.5 | 10.7 | 11.7 |
| Life expectancy at birth (years) | 79.0 | 78.6 | 81.5 |
| Life expectancy at age 65 (years) | 18.9 | 19.6 | 20.3 |
| Sense of community belonging (%) | 72.3 | 74.3 | 67.5 |
| Life satisfaction, satisfied or very satisfied (%) | 91.4 | 92.9 | 91.8 |
| High school graduates aged 25 to 29 (%) | 87.3 | 83.0 | 90.8 |
| Post-secondary graduates aged 25 to 54 (%) | 62.9 | 59.9 | 67.2 |
| Long-term unemployment (%) | 5.3 | 5.1 | 4.8 |
| Low income (%) | 11.6 | 11.0 | 14.5 |
| Seniors, 65 years and older, as a proportion of total population (%) | 16.4 | 14.0 | 12.7 |
| Mental illness hospitalization rate (per 100,000 population) | 1,007 | 1,098 | 442 |
| Mental illness patient days (per 10,000 population) | 1,661 | 1,280 | 547 |
| Doctors rate – General/family physicians (per 100,000 population) | 99 | 116 | 95 |
| Doctors rate – Specialist physicians (per 100,000 population) | 69 | 69 | 99 |

Data retrieved from: Statistics Canada. North East (Health Region), Ontario and Ontario (table). Health Profile. Ottawa, ON. 2013 and Statistics Canada. North West (Health Region), Ontario and Ontario (table). Health Profile. Ottawa, ON. 2013

### 1.1.3 Health Issues in Rural, Remote, and Northern Ontario

One of the main concerns of residents in rural areas across Canada is an inability to access the necessary health services in a timely fashion and closer to home.[1] This stems from multiple factors including, but not limited to: geographic remoteness, long travel distances, low population density, lower availability of health providers, inclement weather conditions[4], and transportation issues.[3, 4, 14] The inability to access necessary health services in a timely fashion is often seen as a major issue for residents in Northern Ontario.[4] When comparing urban residents to their rural counterparts, the latter group tend to have greater difficulties in accessing health care resources.[3, 7-11, 14, 15] A major problem for rural individuals is the distance that needs to be travelled in order to reach certain health services.[1, 3] This problem is also seen for some remote communities without year-round road access, where patients must travel by plane for the nearest hospital-based services. In these circumstances, the weather can play a crucial role in permitting transportation, making travel dangerous or impossible for days.[1] The vast majority of these remote communities are home to First Nations, Métis, and Inuit populations, who's health and well-being is being continually challenged due to the multiple barriers that make access to health care services a challenge.[16] These Indigenous communities also already suffer from multigenerational trauma due to inequitable social determinants of health.[16] For many of these same remote communities, access in winter

months is possible through the use of temporary ice roads. Even then, the distances that must be travelled are still long and also impacted by weather. While inclement weather may affect transportation access, it is also a cause of poor visibility and road conditions, leading to a propensity for vehicle accidents, injuries and even death. Transportation issues also affect referral rates to specialists due to the challenges to access these services that are always provided in urban communities.[14] Thus, travelling great distances to access health services in urban communities presents a barrier for rural residents, and this contributes to a poorer health status. For example, according to the *Frontline Health Care in Canada: Innovations in Delivering Services to Vulnerable Populations*, "studies have shown that in communities lacking maternity services, there is an increased incidence of perinatal deaths and premature birth" (p.8).[6]

In February 2015, the Ontario Ministry of Health and Long-Term Care (MOHLTC) released the document *Patients First: Ontario's Action Plan for Health Care* to provide recommendations for the goal of transforming the health care system of Ontario with the purpose of centering on the needs of patients.[17] This document, which built on the 2012 version of *Ontario's Action Plan for Health Care*,[18] emphasized the importance of placing its patients at the center of health care. In the *Patients First: Action Plan for Health Care*, it stated that patients need faster access to health care, patients were having difficulty accessing health care services when they needed it, and there was a lack of coordination between health care providers when more than one would be interacting with the same patient.[17] This compounds the issue surrounding health care services,

access, and transportation issues in Northern Ontario. According to the *Northern and Health Care Framework/Plan*, health care services and access to them constitute approximately a ten percent share towards an individual's overall health status, including an individual's health and longevity.[4]

### 1.1.4 Access to Health Human Resources

Unlike urban centres, many rural communities encounter challenges related to health promotion programs, poor access to emergency and acute care services, a lack of diagnostic services, and a lack of non-acute health care services.[1] Rural communities also experience an under-servicing of special-needs groups, including seniors and people with disabilities. [1] Coupled with these challenges, rural residents also face problems with the availability of health care providers. Some common obstacles experienced in rural communities include a lack of medical specialists, continuity of providers, and an uneven distribution of physicians, nurses, occupational therapists, social workers, dentists, psychiatrists, and other medical specialists.[1,6-10,14] In fact, rural residents also have a harder time securing a regular medical doctor.[10, 11] As previously mentioned, the NE LHIN and the NW LHIN are still struggling to adequately foster health services for rural, remote, and northern populations. As indicated in Table 1-1, only 84.1% of those in the NE LHIN and 84.3% in the NW LHIN have regular access to a medical doctor, compared provincial average of 91.1% for Ontario. It was also reported by Statistics Canada that for the period between January 1st 2011 and December 31st 2012, the specialist-to-population

rate for NE and NW LHINs were 69 specialists per 100,000 population, whereas the Ontario average was 99 specialists per 100,000 population (Table 1-1).

The unevenness of health care providers is not limited to those living in rural and Northern Ontario. In remote Indigenous communities, people's health and well-being is being continually challenged by multiple barriers and this is further exacerbated by multigenerational trauma due to inequitable social determinants of health.[16] Nationally, it is estimated that Canada is lacking around 1,500 rural physicians.[6] This lack of general physicians and specialists creates additional concerns by requiring rural residents to sometimes travel great distances in order to receive specialized care. This need to travel can increase the financial burden due to travel costs, such as accommodation and meals and these can be partially covered by travel grants. The need to travel to urban communities can also lead to additional stress by separating people from their family supports.[6] Another rising concern in the rural health care system is the lack of health care services and difficulty in accessing them.[1] This includes a lack of access to emergency and acute care services, non-acute health care services, and services for special needs groups.[1]

## 1.2 An Aging Ontario Population

In addition to health care challenges for rural communities, the Ontario health care system is also faced with another challenge: an aging population that requires additional

health care resources.[17] It was estimated that in 2011, 14.6% of Ontario's population,[19, 20] and in 2016, 16.5% of Canada's population,[21] was aged 65 or older. However, this cohort is expected to double by the year 2036, suggesting that over a quarter of the entire Canadian population will be over the age of 65.[22] In 2013, the population health profile characteristics reported that 12.7% of the population of Ontario were seniors aged 65 and older (Table 1-1). In contrast, the population health profile characteristics also reported that 16.4% of the population of the NE LHIN and 14.0% of the population of the NW LHIN were seniors aged 65 and older (Table 1-1). As such, since the proportion of the population aged 65 and older is expected to double by the year 2036,[22] it can be speculated that health services in areas with higher proportions of seniors, such as the NE and NW LHIN, may become overwhelmed. With that said, two of the most common challenges for the health care system due to an aging population include an increase in: (1) hospital resources utilization; and (2) health care costs. In fact, it was previously determined that seniors aged 65 and older use around 40.0% of all hospital services in Canada[22] and also contribute to nearly half of all health care costs in Ontario.[19, 20, 22] This is the result of complex issues requiring expensive and intensive types of services that are characteristic of providing health care for seniors. [19]

A senior population is also more susceptible to higher rates of injuries and illnesses such as falls or influenza that could potentially be reduced.[23] Upwards of 15 to 20% of seniors aged 65 and older will have limitations when it comes to daily, physical, and social activities, as well as mobility.[24] Unfortunately, these characteristics are often linked with

functional decline, morbidity, mortality, and institutionalization.[25] Combined with their increase in age, seniors residing in rural communities also face additional challenges, due to a lack of health care services. The lack of health promotion and screening services in rural communities[1] could affect individuals who may require preventative interventions. For example, many elderly patients attend the ED after an accident or a fall,[25] however this could possibly be prevented with proper fall prevention awareness or other types of health promotion services.

### 1.2.1 Sustainability of the Ontario Health Care System

Many older adults and seniors typically have at least one chronic disease or condition that usually requires complex care from different health providers.[19] This adds to an increased risk of being hospitalized[7] and more difficulties when it comes to accessing medical specialists.[9] Patients with chronic diseases also usually require an increase in the usage of health care resources and are currently costing the health care system billions of dollars each year.[26] In 2015, a retrospective longitudinal analysis was conducted on all residents of Ontario that were eligible for publicly funded health care between 2009 and 2011.[27] It was determined that of individuals aged 65 and older, 5% of patients with the greatest health care costs accounted for 44% of the total expenditures.[27] If not addressed, this increase in health care spending could negatively affect the universal healthcare system in Ontario and across Canada.[19] Therefore, in order to achieve a sustainable and cost-effective health care system across Canada and Ontario, it is important to address the

health care needs that come with an aging population, particularly those with complex needs.[28] In order to maximize access to health services there is also a need to emphasize health promotion services and address local health needs.[28]

## 1.3 Ontario Ministry of Health and Long-Term Care Reform

Many government reports have been published that highlight crucial gaps in the health care system and provide key recommendations to address these gaps.[17-19,29-33] In May of 2012, the Ontario Minister of Health and Long-Term Care (MOHLTC) announced Dr. Samir Sinha as the Provincial Seniors Strategy Expert Lead. Dr. Sinha published the report *Living Longer, Living Well: Report Submitted to the Minister of Health and Long-Term Care and the Minister Responsible for Seniors on Recommendations to Inform a Seniors Strategy for Ontario* (LLLW).[19] The report highlighted five principles for a Seniors Strategy for Ontario: access, equity, choice, value, and quality.[19] The report also compiled key recommendations towards improving, sustaining, and rendering health care more accessible to the elderly population of Ontario.[19]

Also, in 2012, the MOHLTC released the *Ontario's Action Plan for Health Care.*[18] As mentioned previously, this document was designed to provide better access to care with the goal of strengthening and protecting the health care sector of Ontario. The *Ontario's Action Plan for Health Care*, introduced "Health Links" (HL) as a key commitment by

the MOHLTC to transform the system through increasing access to integrated, quality services for Ontario's complex patient population.[29] Precisely, HL will:

> Encourage greater collaboration and co-ordination between a patient's different health care providers as well as the development of personalized care plans. This will help improve patient transitions within the system and help ensure patients receive more responsive care that addresses their specific needs with the support of a tightly knit team of providers (p.3).[29]

Expanding from the 2012 version of *Ontario's Action Plan for Health Care*,[18] the 2015 *Patients First: Ontario's Action Plan for Health Care*[17] emphasized the importance of placing its patients at the center of health care by focusing on four critical objectives: (1) improving access, (2) connecting services, (3) supporting people and patients, and (4) protecting our universal health care system. Since then, the *Patients First: Ontario's Action Plan for Health Care*[17] has already contributed to transforming the health care system. In fact, many positive outcomes related to the four key objectives were released in the 2016 *Patients First: Action Plan for Health Care – Year One Results*[30] and the 2017 *Patients First: Action Plan for Health Care – Year Two Results*.[31] One direct outcome was the implementation of the *Patients First: A Roadmap to Strengthen Home and Community Care*,[32] which suggested ten steps to strengthen home and community care that patients receive. The ten steps highlighted by the document were deemed to be integral to provide consistent higher quality community care for a period of three years following the documents publication. Overall, the main goals of the document included placing clients and caregivers first; improving the client and caregiver experience;

driving greater quality, consistency, and transparency, planning; and expanding and modernizing the delivery of health services.[32] Another outcome of the *Patients First: Ontario's Action Plan for Health Care* was the formation of the *Patients First Act* which transfers more responsibilities to the LHINs to improve access to care for all people across Ontario.[33]

## 1.4 Ontario Emergency Department Utilization and Hospital Admissions

Currently, an aging population is challenging the sustainability of Ontario's health care system.[19] This sustainability of health care is also under additional pressure caused by those residing in rural areas. Rural communities, especially those in Northern Ontario, have raised concerns over challenges with access to service and resources, inter-sectoral and cross-jurisdictional coordination, transportation, and patient-care planning.[4] In addition to the rural health care issues related to access to services, the complex health needs of the senior population exacerbate challenges. Not surprisingly, seniors are more likely to use a local hospital ED to address their health needs.[34-39] According to research conducted by Bond et al.[39] on six EDs in Alberta, Canada, seniors comprise between 14% to 21% of all ED visits. A study comparing ED rates in the United States and Ontario, Canada, also discovered that patients aged 75 and older had a higher ED visit rate than those of a younger age.[39] The resource requirements also increase for geriatric patients[40] with lengthier stays in the ED and increased likelihood of repeat ED visits.[34]

In many cases, these repeat ED visits may contribute to a large portion of the total number of ED visits.[37,41-43] Repeat ED visits can also pose challenges by increasing wait times, delaying diagnosis and treatments, reducing the availability of acute care beds,[41,44] and leading to misuse of services.[45] Given adequate supports, many of these repeat patients could return home instead of occupying acute care beds.[45] In addition, diverting repeat ED patients to other community health services may also help offset increasing health care costs while improving access to appropriate health care services.[29] In the *Patients First: Ontario's Action Plan for Health Care*, it was stated that over 271,000 ED visits in Ontario hospitals during 2010-2011 could have been treated in other health care settings.[18] This diversion to other services could have also led to more appropriate services and a lower cost.[18] However, if the right home and community care services are not available, patients may potentially be re-admitted to the hospital.[18] In 2009, over 140,000 patients that were discharged home without having adequate community resources in place to accommodate their needs were re-admitted within 30 days of their original discharge.[18] Thus, to offset the complications caused by rural health care challenges and an aging population, new approaches must be developed to maximize the efficiency of health services in Northern Ontario.[28] Additionally, more research is needed to better understand the reasons for repeat ED visits and multiple admissions for patients at small rural hospitals in Northern Ontario, in order to determine the best health care services for this population.

## 1.5 Introduction to Community Paramedicine

One of the many significant problems surrounding health care is the fact that many older adults cannot easily find or access a primary care provider,[46] especially in rural areas.[4] Despite the lack of access to care, many elderly patients simply need basic assessment and referral to an appropriate community service.[22] Many seniors with minor injuries not requiring admission often seek care in the ED.[25] A sub group of these patients are often known to make multiple repeated visits to the ED, accounting for a substantial portion of the total number of visits.[41] A considerable number of these patients could also return home with adequate community supports in place, reducing the use of acute care beds.[45] In many instances, individuals who initiate calls to emergency medical services (EMS) often feel the necessity for urgent care, however, it has been shown that they would benefit more from an alternative level of long-term care that more appropriately addresses their unmet social or medical needs.[47] It has been suggested that alternative approaches to standard emergency response could improve patient experiences while at the same time reducing the number of unnecessary patient visits to the ED, decreasing staff workloads, and lessening waiting times.[48] Thus, in order to improve health care access and services, it is necessary to develop and enhance novel community-based health initiatives.[26] One initiative that is gaining traction is the development of CP programs. According to the International Roundtable on Community Paramedicine:

> Community paramedicine is a model of care whereby paramedics apply their training and skills in "non-traditional" community-based environments, often outside the usual emergency response and transportation model. The community paramedic practices with an "expanded scope", which includes the application of specialized skills and protocols beyond the base paramedic training (paragraph 5).[49]

In many cases, mobile integrated health care and CP programs have been implemented with the intention of addressing and improving wellness, prevention, care for the chronically ill (post-discharge), and other services.[15,50-55] Paramedicine is expanding from emergency response and patient transport towards a discipline that integrates more preventative medical and health promotion services.[16,56-57] This in turn, has a potential at improving the level of health care and suppressing system strain within a community.[45] In 2011, the Emergency Medical Services Chiefs of Canada (EMSCC) released a white paper called *Community Paramedicine in Canada*. This white paper was developed in order to meet a recommendation from the previous EMSCC white paper titled *The Future of EMS in Canada*, which recommended that:

> EMS must pursue innovation and new models of service delivery to meet the community-defined needs. Collaboration of EMS and community organizations, social service agencies, and public safety groups will enable innovative initiatives that have the potential to improve the level of health care within a community (p.57). [22]

This document also highlights six significant positive outcomes of CP programs. Initially, they state that CP programs will "assist in alleviating the increasing pressure on our

health care system" (p.60) by achieving significant savings in health care,[22] which has already been seen with CP programs in Canada[51,53] and the United States.[54,55] The EMSCC white paper also stated that in addition to achieving these savings, CP programs will effectively reduce the volume of 911 calls, reduce the number of ED visits, reduce the number of hospitalizations, reduce the demand on long-term care beds, reduce mortality and morbidity rates, and address other gaps in the health care system.[22] These outcomes of have all been shown in CP programs across Canada,[51-53] the United-States,[50,54,55] and Australia and New Zealand.[58]

In the LLLW report, Sinha also highlighted the importance of promoting models of CP that will help reduce the number of hospital admissions or the duration of hospital visits among the elderly.[19] In that report, Sinha recommended that:

> The Ministry of Health and Long-Term Care, in collaboration with Local Health Integration Networks (LHINs) and local municipal Emergency Medical Services (EMS) programs should explore the development and expansion of Community Paramedicine programs across Ontario, especially in northern and rural communities. These programs could better support high uses of EMS to avoid emergency department (ED) visits and hospitalizations and potentially delay entry into a long-term care home as well (p.17). [19]

In addition to the LLLW report, the *Patients First: Action Plan for Health Care* also highlighted the importance of CP programs.[17] By using CP programs, community paramedics may perform community referrals, circle of care partnerships, paramedic

directed home visits (HV), and CP clinics, also known as wellness clinics (WC).[59-61] The patients receiving these services are then able to access medical services before the need to call 911 arises. This could potentially reduce the number of emergency calls, particularly non-urgent low-priority calls, allowing emergency services to focus on high-priority calls instead. Through CP, proponents suggest that patients will also be able to receive relevant health information or referrals to appropriate community services. Since patients may then receive more appropriate CP services prior to a potential emergency call, this may also lead to early detection of medical problems.[50-55,58] Thus, CP initiatives that provide early screening and health promotion services could potentially reduce hospitalization rates among those that are most vulnerable.[50,54,58] This reduction in hospitalizations can help reduce the demand on long-term beds, allowing patients to remain independent and in their own homes for longer.

### 1.5.1 Community Paramedicine Programs in Northern Ontario

In 2012, the MOHLTC allocated a $6 million investment to initiate the development and expansion of 30 pilot CP programs throughout Ontario.[62, 63] After program development and paramedic training, several pilot CP programs in Northern Ontario were launched in 2015, with the majority being launched in rural communities. CP programs in Northern Ontario are currently coordinated by the following EMS providers: the Cochrane District Social Services Administration Board EMS, the Manitoulin-Sudbury District Services Board EMS,[59, 64] the Rainy River EMS, and the Superior North EMS.

The four CP programs in Northern Ontario all focus on providing four initiatives to help improve health care and access to health care services for those in the pilot communities. These four initiatives include: community referrals, circle of care partnerships, paramedic directed HVs, and WCs.[59-61]

Unlike other CP programs, these four CP programs utilize paramedics while on regular duty.[59, 61] As mentioned in one of the original funding proposals, "the community paramedics will only work within their current scope of practice (and) they will work under the guidance and supervision of their employers and Base Hospital" (p18).[65] The proposal indicated that the use of on duty paramedics can also create the potential to decrease emergency response times by continuously roaming the community while delivering their services for CP. As well, it was deemed that the dual role of on duty paramedics would not interfere with their ability to provide emergency response, since proper deployment plans would reflect the emergency priority.[65]

Recently, a study on a CP program in Southern Ontario discovered three common themes that were present while evaluating participants' perceptions of the services they received.[66] The results of that study concluded that CP services fostered: caring and trusting relationships, paramedics as health advocates, and the added value of EMS skills.[66] However, the literature surrounding participants in CP programs is limited. Thus, there is a need to collect additional information related to participants' experiences[66] and identify best practices among CP initiatives.[67]

## 1.6 Frameworks for Patient-Centered Care

Greene et al.[68] describe patient-centered care as that which "honors and responds to individual patient preferences, needs, values, and goals" (p.1). In patient-centered care, the patient's preferences, objectives, and values should play a fundamental role in shared decision-making, and the physician then becomes the "enabler who supports the patient to make informed decisions" (p.7).[69] Sacristan et al.[69] emphasized that:

> The final objective should not be to know what is the best treatment for the average patient, but to improve the health outcomes of individual patients, while ensuring the results of medical research have a real impact on healthcare (p.7).[69]

The literature provides a variety of frameworks available to guide patient-centered care. These frameworks often consist of multiple dimensions. Greene et al.[68] summarized the literature and identified three dimensions of a Patient-Centered Care Framework (PCCF) that must be present and integrated by health care providers when making patient-centered care part of the culture of care. Those three dimensions are: (1) an interpersonal dimension (relationship) consisting of communication, knowing the patient, and importance of teams; (2) a clinical dimension (provision of care), which features clinical decision support, coordination and continuity, and types of encounters; and (3) a structural dimension (system features) that includes the built environment, access to care, and information technology.[68] In Ontario, the MOHLTC developed the Ontario Chronic Disease Prevention and Management (CDPM) Framework. The CDPM framework is an

approach to chronic disease prevention and management that is evidence-based, population-based, and client-centered.[70] It supports the health care system transformation from one that is designed for episodic, acute illness to one that will support the prevention and management of chronic disease.[70] The Ontario CDPM Framework is based on Wagner's Chronic Care Model[71] and the Expanded Chronic Care Model.[72] According to the MOHLTC:

> The Framework's roadmap for effective chronic disease management addresses the distinct needs of clients with chronic conditions as it aims to provide multifaceted, planned, pro-active seamless care in which the clients are full participants in managing their care and are supported to do this at all points by the system. Ontarians with chronic conditions will experience a change both in their care and their disease management. They will become equal partners in their own health and full collaborators in managing their conditions, and they will be supported in this. Their care will be organized and delivered to give the expert care they need when and where they need it, without their having to struggle through the system on their own, bounced from provider to provider. Their care will be planned and based on the best evidence, and both providers and clients will be supported in following through with the plan (p.9).[70]

Thus, the PCCF is an important framework that helps guide patient-centered care[68] and the Ontario CDPM Framework is an important framework that tackles the problems associated with preventing and managing chronic disease.[70] For the purpose of this study, the PCCF was implemented to evaluate how well CP provided patient-centered care and to determine if the CP services were reflective of the interpersonal, clinical, and structural

dimensions and attributions of the PCCF.[70] This framework was also selected because it was comprehensive and well supported in the literature.[72-75]

## 1.7 Overview of Thesis and Integrated Articles

This thesis adhered to an integrated article format with two distinct studies focusing on hospital resource utilization in a small community in rural Northern Ontario (Chapter 2) and the experience of patients receiving CP services (Chapter 3).

The first study (Chapter 2) was a case approach involving the analysis of patient medical records from a rural hospital in Northern Ontario and is entitled *Utilization of a rural hospital in Ontario, Canada: Understanding reasons for repeat emergency department visits and multiple admissions over a fourteen-month period.* The purpose of this first study was to understand the reasons for repeat ED visits and multiple admissions in a rural hospital in NE Ontario. Patients included in this study were those that were either seen in the ED 11 or more times, or admitted for at least one night three or more times, between the study period of April 1 2015 and May 31 2016. Two nurses at the hospital conducted a retrospective chart review for all patients matching the inclusion criteria and afterwards provided the anonymized data to the principal investigator. The two main research questions for this study were: (1) Which types of patients are more prone to having repeat ED visits and hospital admissions; and (2) What types of services could help improve the health of these patients? Analysis involved categorizing reasons for

repeat ED visits and diagnoses for repeat admissions. The results were then verified and approved by a nurse from the hospital for consistency and accuracy.

The second study (Chapter 3) was a cross-sectional observational study seeking patient perspectives on a new model of health care and is entitled *Patient experiences related to community paramedicine programs in Northern Ontario, Canada*. The purpose of this second study was to compile patient perspectives related to the services they received while enrolled in the CP program. This study utilized a self-report questionnaire that was completed by willing participants receiving either WC or HV services from a CP program in Northern Ontario. There were two research questions guiding the evaluation of patient perspectives in this study: (1) How effective is CP at supporting patient-centered care; and (2) How do perceptions differ between HV and WC patients? The Three Dimensions of PCCF[68] guided the analysis of this study by associating patients' open-ended answers from the survey with the relevant dimensions and elements of the framework.

The fourth and final chapter of the thesis includes an integration of chapters 2 and 3, as well as an overall discussion on the MOHLTC patients-first reform. In this chapter, a discussion on the limitations of the study, as well as the implications, will be presented.

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# Chapter 2

## 2. Utilization of a rural hospital in Ontario, Canada: Understanding reasons for repeat emergency department visits and multiple admissions over a fourteen-month period

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**Note: The target journal for submission of this article is yet to be determined.**

### 2.1 Abstract

**Purpose:** This study highlights the most common reasons for repeat emergency department (ED) visits and diagnoses of repeat hospital admissions at the Smooth Rock Falls Hospital, located in a rural community in Northern Ontario, Canada. The aim of this study was to help hospital administrators identify patients at high risk of frequent hospital resource utilization (ED visit or admissions) so that if appropriate, they may be redirected to alternative services available in the community. Therefore, the two main research questions for this study were: (1) Which types of patients are more prone to having repeat ED visits and hospital admissions; and (2) What types of services could help improve the health of these patients?

**Method:** A secondary analysis was conducted using a hospital database created from a retrospective review of patient records. Inclusion criteria were all patients with eleven or more ED visits, or three or more inpatient hospital admissions within the evaluation period of April 1, 2015 to May 31, 2016.

**Results:** Twenty-six patients met the criteria for repeat ED visits (65% female; mean age 52 years) and accounted for a total of 623 ED visits. Seventeen patients met the criteria for repeat admissions (41.2% female; mean age 73 years) and accounted for 69 repeat hospital admissions. Three patients met the criteria for both repeat ED visits and admissions. The most common reason cited for repeat ED visits was dressing changes and the most common reason cited for repeat admissions was chronic obstructive pulmonary disease (COPD).

**Discussion**: These analyses led directly to the identification of an opportunity for: (1) home visits by nurses from the Community Care Access Centre for dressing changes and antibiotic treatments; (2) home visits by paramedics practicing community paramedicine, and (3) remote patient monitoring for patients with COPD, congestive heart failure, and other chronic diseases.

**Conclusion:** This study identified the most common reasons for repeat patient ED visits and repeat hospital admissions, and the findings led to a productive dialogue about optimizing health services to meet the needs of patients in one rural NE Ontario

community. It is possible that other small rural hospitals could benefit from initiating similar data-driven quality improvement initiatives in order to optimize health care services for the communities they service.

## 2.2 Introduction

The healthcare system in Canada faces a burden due to an aging population that will present a growing demand on healthcare and emergency services.[1, 2] Between 2011 and 2016, the Canadian and Ontarian population of seniors over the age of 65 increased from 14.8% to 16.9% and 14.6% to 16.7% respectively.[3, 4] For a large number of elderly patients, their poor physical health increases their chances of visiting the ED.[5] Older patients also have increased odds of visiting the ED[6] or being admitted[7] due to chronic illness.[7-9]

Many studies have determined the risk factors for repeat emergency department (ED) visits[10-16] and there have been multiple studies that have examined risk factors for hospital readmissions.[17-21] However, there is a need to understand the reasons for repeat visits in order to reduce inappropriate utilization and optimize patient care.[11, 22] There is also a need to further understand this in less populated areas in Ontario, since the accessibility of health care in rural, remote and northern communities is a long-standing issue.[23]

Many rural communities lack adequate services related to health care that meet the needs of special populations such as seniors and people with disabilities.[24] Compared to urban centres, residents in rural Ontario have additional challenges related to access to services and resources; inter-sectoral and cross-jurisdictional coordination; transportation; and patient-care planning.[23] Rural communities also face problems with the lack of availability and an uneven distribution of physicians and other regulated health care providers.[24, 25]

Repeat ED visits made by a small number of patients account for a large proportion of the total number of visits.[6, 7, 9, 14, 15, 26-28] In their 2010 literature review of frequent ED users, LaCalle and Rabin[7] found that 4.5-8.0% of ED patients accounted for 21.0-28.0% of all ED visits, across various EDs in the United States. Three other studies also found that patients with 4 or more ED visits over a 12-month period made up 5.5-22.9% of patients seen, despite accounting for 22.0-48.0% of the total ED visits.[9, 15, 24] Similarly, another study found that 0.3% of patients visited the ED 12 or more times in one year, with that group of patients accounting for 3.5% of all ED visits.[14] However, there is still great variability on what defines a frequent ED user, since two other studies defined frequent ED as those having more than six visits to the ED in a 12-month period.[27, 28] These studies found that patients having six or more visits in one year consisted of 5.7 to 7.2% of all ED patients and they accounted for 21.1% to 31.3% of all ED visits, respectively.[27,28]

A qualitative study on patient perspectives by Howard et al.[29] found three common reasons for repeat ED usage by patients at three urban American hospitals in Ohio, USA: (1) inability to obtain an appointment with their primary care provider, (2) referral to the ED by the primary care provider's staff, and (3) faster access to immediate care. Other studies found similar findings, where patients presented to the ED because their primary care provider was unavailable,[7, 22, 30] referred them to the ED,[31] or practiced at the hospital associated with the ED.[8]

The definition of a repeat ED visit varies widely between studies, ranging from 4 to 20 or more ED visits in a 12-month period.[9, 15, 27,28, 32-37] The definition of a repeat hospital admission patient also varies between studies, and can be defined as a patient being admitted within 30 days of being initially discharged or having an unplanned admission within 14 days of initial discharge.[38, 39] Patients that have been seen in the ED, or are admitted to a hospital multiple times within 72 hours, are often colloquially referred to as "bounce-back" patients.[32]

Multiple studies have mentioned a need for interventions to reduce frequent ED visits.[6,8,14] These interventions target patients with comorbid conditions[6] or specific populations at risk for frequent ED visits.[8] While a decrease in health status often leads to patients frequently attending the hospital,[5] the cost associated with this utilization is a substantive burden on the health care system. In comparison to outpatient services, Pines et al.[8] indicated that an increase in hospital admissions leads to greater health care

expenditures; thus, patients who frequently attend the ED and are admitted to the hospital may represent one of the highest cost groups. Frequent visits can also lead to increased wait times, delayed diagnosis and treatment, and reduced availability of acute care beds.[40,41] By identifying specific populations and reasons for repeat ED use, it may be possible to reduce frequent ED visits,[8] or redirect patients to appropriate community health services that are more cost-effective.[42] As such, this study conducted a utilization review to understand the most common reasons for repeat ED visits and most common diagnoses of frequent admissions to a rural hospital in north east (NE) Ontario. The aim of this study was to help hospital administrators identify patients at high risk of frequent hospital resource utilization (ED visit or admissions) so that if appropriate, they may be redirected to alternative services available in the community. Some of the alternative services that will be proposed include Health Links (HL),[43] Community Care Access Centres (CCACs),[44] and community paramedicine (CP).[45]

## 2.3 Method

Our study involved a secondary analysis of patient records obtained from a hospital in a rural community in NE Ontario, Canada. The database of records was originally accessed under a quality improvement initiative, and subsets of de-identified data were analyzed. The data were analyzed descriptively to identify frequencies and trends related to reasons for repeat ED and hospital readmissions.

### 2.3.1 Setting

The hospital is located in Smooth Rock Falls, a small rural community in NE Ontario, Canada with a population of 1,330.[4] Thirty-five percent of the residents in the community are over the age of 60 and the population is predominantly Francophone (64.7%).[4] This community has one hospital containing 14 acute care and 23 long-term care beds. The Smooth Rock Falls Hospital (SRFH) ED provides two examination rooms, one fracture room, one minor surgery room, and one trauma room. The hospital is also supported by laboratory, physiotherapy, and diagnostic imaging departments. However, patients requiring other advanced services or specialist appointments must travel to the nearest urban hospital, which is over 100 kilometers by road.

The local health clinic is adjacent to the hospital, and it provides primary care services to patients by appointment only. There is one physician present in the community at a time, and this physician is responsible both for responding to ED visits and for running a family practice in the health clinic during weekdays.

The nursing staff is comprised of approximately 40 nurses, this includes full- and part-time registered nurses and registered practical nurses. On a daily basis, there is one registered nurse working in the ED, one registered nurse working in acute care, and one registered practical nurse working in long-term care. The hospital also has access to telemedicine services and is affiliated with the local HL. The HL is a relatively new

initiative in Northern Ontario involving a diverse team of providers focused on developing care plans for patients with complex needs.[43]

### 2.3.2 Study Population

The evaluation period was from April 1, 2015 to May 31, 2016 (14 months). The original intention for this study was to include patients presenting to the ED 20 or more times, as well as patients admitted five or more times, in a twelve-month period. These original criteria were selected by the hospital studied and the local HL as a common target population that would include the 5% of the population of Ontario who are responsible for 65% of health care use, which also overlapped with high cost users, included patients with high needs, and patients with four or more chronic/high cost conditions.[43] However, this only yielded 16 patients. Thus, to increase sample size, the study period was expanded to 14 months, and the inclusion criteria were modified to include patients: (1) presenting to the ED 11 or more times; or (2) admitted three or more times within the study period. The Chief Executive Officer of SRFH worked with the research team to refine the criteria to ensure clinical and contextual relevance.

### 2.3.3 Data Collection

Hospital staff conducted a retrospective review of patient records to identify patients matching the inclusion criteria. All personal identifying information was removed and

replaced with a unique patient identifier prior to analysis by the research team. Data fields extracted from the database were: sex, age, dates (ED visit, admission, and discharge), reason for the ED visit or diagnosis of admission provided by the physician.

### 2.3.4 Data Analysis

ED and hospital admission data were analyzed separately in Microsoft Excel to identify frequencies and trends related to patients with repeat ED visits and with multiple admissions. The principal investigator categorized all reasons for ED visits and diagnoses for admission; this classification was then verified and approved by a nurse from the hospital.

Age and sex trends were also analyzed. Patients aged 64 and under were compared to those aged 65 and older, as local data on ambulance use shows that hospital utilization increases dramatically for those aged 65 or older.[46]

### 2.3.5 Ethics Approval

Ethics approval (Appendix A) was granted on October 28, 2016 from the Laurentian University Research Ethics Board (REB #6009551).

## 2.4 Results

During the 14-month evaluation period, there were a total of 1,382 unique patients, 3,437 ED visits, and 251 admissions at the SRFH. The inclusion criteria resulted in a total of 43 patient records available for analysis: twenty-six patients were found to have 11 or more ED visits, 17 had three or more admissions; three patients met the criteria for both.

### 2.4.1 Frequent Emergency Department Visits

The 26 patients with repeat ED visits made up only 1.9% of the 1,382 unique patients seen during the study period, however they accounted for 18.1% (n=623) of the total ED visits. The mean age of the frequent ED patients was 52 years and 57.7% (n=15) were female (Table 2-1).

**Table 2-1 – Frequent ED utilization by sex and age**

| | Male | Female | Age 64 or younger | Age 65 or older |
|---|---|---|---|---|
| **Number of patients (n =26)** | 11 (42.3%) | 15 (57.7%) | 20 (76.9%) | 6 (23.1%) |
| **Total number of ED visits (n=623)** | 287 (46.0%) | 336 (54.0%) | 449 (72.1%) | 174 (27.9%) |
| **Mean number of ED visits per patient per year** | 22.4 | 19.2 | 19.2 | 24.9 |

In Table 2-2 the top five reasons for all ED visits by sex and age for the 26 high frequency ED patients are shown. The need for dressing changes was the most frequent reason, accounting for one-third of all visits and affecting 38.5% (n=10) of frequent ED users. This was the most frequent reason across age and sex categories.

The second most common reason for repeat ED visits for all patients was the need for nebulizer treatments, however 87.5% (n=42) of these were females aged 64 years or younger (Table 2-2). Illnesses that required antibiotic treatments were the third most common reason for repeat ED visits, however 97.8% (n=45) of these ED visits were for male patients. The fourth most common reason for repeat visits was for pain-associated incidents. The fifth most common reason for repeat ED visits were for wart removals, despite these being entirely associated with female patients under the age of 65.

However, it is important to note that the International Classification of Diseases, Tenth Revision, (ICD-10-CM)[47] coding was not used for every ED patient visit. Therefore, specific diagnoses may not have been properly charted. For example, a patient could initially present with a wound that is charted as cellulitis which would then require intravenous antibiotics and frequent dressing changes. It is possible that the initial ED visit is charted as either a wound or cellulitis and then the follow-up ED visits are charted as intravenous antibiotics or dressing changes, despite still being for cellulitis. To attempt to minimize the possibility of overlap, the principal investigator categorized all reasons

for ED visits and this classification was then verified and approved by a nurse from the hospital.

**Table 2-2 - Top five reasons for frequent ED visits by sex and age[§]**

| Reason for ED visit | All patients | | Males | | Females | | Age 64 and younger | | Age 65 and older | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of visits (Rank) | Percent of all visits | Number of visits (Rank) | Percent of all visits | Number of visits (Rank) | Percent of all visits | Number of visits (Rank) | Percent of all visits | Number of visits (Rank) | Percent of all visits |
| Dressing change | 206 (1) | 33.1 | 135 (1) | 47.0 | 71 (1) | 21.2 | 136 (1) | 30.3 | 70 (1) | 40.2 |
| Nebulizer treatment | 48 (2) | 7.7 | 6 (†) | 2.1 | 42 (2) | 12.5 | 42 (3) | 9.4 | 6 (†) | 3.4 |
| Injury/Illness requiring intravenous antibiotics | 46 (3) | 7.7 | 45 (2) | 15.7 | ¶ | --- | 46 (2) | 10.2 | ¶ | --- |
| Pain | 40 (4) | 6.4 | 14 (5) | 4.9 | 26 (5) | 7.7 | 27 (†) | 6.0 | 13 (4) | 7.5 |
| Wart removal | 33 (5) | 5.4 | ¶ | --- | 33 (3) | 9.8 | 33 (4) | 7.3 | ¶ | --- |
| Wound | 30 (†) | 4.8 | ¶ | --- | 29 (4) | 8.6 | 30 (5) | 6.7 | ¶ | --- |
| Pneumonia | 18 (†) | 2.9 | 18 (3) | 6.3 | ¶ | --- | ¶ | --- | 18 (2) | 10.3 |
| Urinary tract infections | 18 (†) | 2.9 | 17 (4) | 5.9 | ¶ | --- | 18 (†) | 4.0 | ¶ | --- |
| Cellulitis | 17 (†) | 2.7 | ¶ | --- | 18 (†) | 5.4 | ¶ | --- | 17 (3) | 9.8 |
| Pelvic mass | 17 (†) | 2.7 | 17 (4) | 5.9 | ¶ | --- | 17 (†) | 3.8 | ¶ | --- |
| Chronic obstructive pulmonary disease | 8 (†) | 1.3 | 7 (†) | 2.4 | ¶ | --- | ¶ | --- | 8 (5) | 4.6 |

†Denotes that the ranking was not in the top five most commonly reported diagnoses.

¶ Denotes that n<5 and thus data is suppressed to protect the identity of the patients.

§ International Classification of Diseases, Tenth Revision, (ICD-10) coding was not used for every ED patient visit therefore specific diagnoses may not have been properly charted. For example, a patient could initially present with a wound that is charted as cellulitis which would then require intravenous antibiotics and frequent dressing changes. It is possible that the initial ED visit is charted as either a wound or cellulitis and then the follow-up ED visits are charted as intravenous antibiotics or dressing changes, despite still being for cellulitis.

### 2.4.2 Frequent Hospital Admissions

During the study period, 17 patients were admitted to the hospital three or more times, with each admission lasting a minimum of one night. These 17 patients accounted for 27.5% (n=69, cumulative total of 582 inpatient days) of the total 251 admissions that the hospital had during the study period. Of all 69 repeat admissions, 8.7% (n=6) of these were within 72 hours of the initial admission. The mean age of frequently admitted patients was 73 years and 41.2% (n=7) were female. Seven of these patients (41.2%) died during the study period. In Table 2-3 the number of admissions, inpatient days, and mean number of admissions for the frequently admitted patients are displayed.

**Table 2-3 - Frequently admitted patients by sex and age**

| | **Male** | **Female** | **Age 64 or younger** | **Age 65 or older** |
|---|---|---|---|---|
| **Number of patients (n =17)** | 10 (58.8%) | 7 (41.2%) | 4 (23.5%) | 13 (76.5%) |
| **Total number of admissions (n=69)** | 40 (58.0%) | 29 (42.0%) | 15 (21.7%) | 54 (78.3%) |
| **Mean number of admissions per patient** | 4.0 | 4.1 | 3.8 | 4.2 |
| **Total number of inpatient days (n=582)** | 411 (70.6%) | 171 (29.4%) | 37 (6.4%) | 545 (93.6%) |
| **Mean number of inpatient days per patient** | 41.1 | 24.4 | 9.3 | 41.9 |

In some cases, patients were admitted with multiple diagnoses, resulting in a total of 104 diagnoses for the 69 admissions. The most common diagnosis was chronic obstructive pulmonary disease (COPD) for 18.8% (n=13) of admissions (Table 2-4). The remaining diagnoses of frequent admissions included: mental illness, congestive heart failure (CHF), chronic kidney disease (CKD), general pain, pneumonia, and edema (Table 2-4).

**Table 2-4 - Diagnoses that caused the most frequent hospital admissions**

| Diagnosis† | Total number of admissions (N=69) |
|---|---|
| Chronic obstructive pulmonary disease | 13 (18.8%) |
| Mental illness | 12 (17.4%) |
| Congestive heart failure | 7 (10.1%) |
| Chronic kidney disease | 7 (10.1%) |
| General pain | 6 (8.7%) |
| Pneumonia | 6 (8.7%) |
| Edema | 5 (7.3%) |

† While these diagnoses are the most common, they are not exclusive. An individual may have had an admission with one or more of these diagnoses. (Example: A patient being admitted for COPD and pneumonia.)

While COPD was the most frequent diagnosis of a repeat admission (Table 2-4), CKD was the diagnosis that resulted in the greatest number of inpatient days, accounting for 30.8% of all inpatient days (Table 2-5). This is a significant finding considering that there are no dialysis services available in the community.

The most frequent causes of inpatient days for all 17 repeat admission patients were the same for male patients, patients over the age of 65, and for patients who died during the study period (Table 2-5). Additionally, 64.0% (n=16) of the inpatient days were from females under the age of 65, while only males aged 65 and older were admitted due to requiring alternate level of care. It is also interesting to note that only females were admitted for mental illness-related problems, despite the hospital not being a designated psychiatric facility. However, this could be the result of being in close proximity to the regional detoxification center.

**Table 2-5 - Top five reasons for highest number of inpatient days by age and sex**

| Diagnosis | All patients (n=582 days) | | Males (n=411 days) | | Females (n=171 days) | | Age 64 and younger (n=37 days) ‡ | | Age 65 and older (n=545 days) | | Patients deceased during study period (n=307 days) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inpatient days (Rank) | Percent of all visits | Inpatient days (Rank) | Percent of all visits | Inpatient days (Rank) | Percent of all visits | Inpatient days (Rank) | Percent of all visits | Inpatient days (Rank) | Percent of all visits | Inpatient days (Rank) | Percent of all visits |
| Chronic kidney disease | 179 (1) | 30.8 | 161 (1) | 39.2 | 18 (3) | 10.5 | ¶ (†) | --- | 179 (1) | 32.8 | 179 (1) | 58.3 |
| Congestive heart failure | 153 (2) | 26.3 | 144 (2) | 35.0 | 9 (†) | 5.3 | ¶ (†) | --- | 153 (2) | 28.1 | 126 (2) | 41.0 |
| COPD | 100 (3) | 17.2 | 76 (3) | 18.5 | 24 (2) | 14.0 | ¶ (4) | --- | 99 (3) | 18.2 | 47 (3) | 15.3 |
| Edema | 67 (4) | 11.5 | 49 (4) | 11.9 | 18 (3) | 10.5 | ¶ (†) | --- | 67 (4) | 12.3 | 41 (4) | 13.4 |
| Pneumonia | 47 (5) | 8.0 | 34 (†) | 8.3 | 13 (5) | 7.6 | ¶ (†) | --- | 47 (5) | 8.6 | ¶ (†) | --- |
| Alternate level of care§ | 39 (†) | 6.7 | 39 (5) | 9.5 | ¶ (†) | --- | ¶ (†) | --- | 39 (†) | 7.2 | 39 (5) | 12.2 |
| Mental illness | 25 (†) | 4.8 | ¶ (†) | --- | 25 (1) | 14.6 | ¶ (2) | --- | 9 (†) | 1.7 | ¶ (†) | --- |
| Pain | 25 (†) | 4.3 | 7 (†) | 1.7 | 18 (3) | 10.5 | ¶ (1) | --- | 7 (†) | 1.3 | ¶ (†) | --- |
| Shortness of breath | 26 (†) | 4.5 | 9 (†) | 2.2 | 17 (4) | 9.9 | ¶ (†) | --- | 26 (†) | 4.8 | ¶ (†) | --- |
| Lymphoma | ¶ (†) | --- | ¶ (†) | --- | ¶ (†) | --- | ¶ (3) | --- | ¶ (†) | --- | ¶ (†) | --- |
| Syncope | ¶ (†) | --- | ¶ (†) | --- | ¶ (†) | --- | ¶ (4) | --- | ¶ (†) | --- | ¶ (†) | --- |

†Denotes that the ranking was not in the top 5 most commonly reported diagnoses.

¶ Data suppressed to protect the identity of the patients.

§ There was one record of alternate level of care that did not have the number of inpatient days recorded.

‡ There were only five unique diagnoses given for those aged 64 and under, with COPD and syncope both having the same number of inpatient days.

## 2.5 Discussion

It is well known that a small fraction of the total number of patients that visit EDs account for a large proportion of the total number of visits to EDs.[6, 7, 9, 14, 26-28] Similarly, frequent users at the SRFH were only 1.9% of all ED patients seen during the study period, but they accounted for 18.1% of all ED visits. Dressing changes were the most common reason for repeat ED visits, and COPD was the most frequent diagnosis for admission. CKD accounted for the highest number of inpatient days.

### 2.5.1 Frequent Emergency Department Visits

Many studies have looked at determining the risk factors for repeat ED visits.[10-15] In multiple studies, risk factors associated with repeat ED visits included being a male,[11,15] living alone with several functional deficits related to daily living,[11, 16] and having chronic conditions like COPD and chronic kidney disease.[15,16,27] Another study found that patients presenting to the ED 12 or more times were often female, used more primary care and psychiatric services, and were middle-aged.[14] However, our study found that male patients had more ED visits compared to female patients, which is consistent with previous studies[11,15], while the three most frequent diagnoses for patients with repeat admissions were COPD, mental illness, and CHF.

The results from our study are similar to those found by Gruneir et al.[48] Their study focused on obtaining population-based estimates of ED visits by long-term care residents and determined the most commonly reported reasons for the initial ED visit. They concluded that nearly 25% of initial visits to the ED were classified as potentially preventable and included pneumonia, kidney or urinary tract infections, CHF, and COPD.[48] These diseases were classified as potentially preventable because there is a possibility that they could have been avoided if they were properly managed through primary care services at an earlier stage.[48] A more recent study by Gruneir et al.[15] that examined repeat ED visits by nursing home residents also concluded that there was an increased risk of having a repeat visit if an individual was male, was between the ages of 65 and 75, had moderate activities of daily living dependence, and had chronic medical conditions such as COPD, congestive heart failure, diabetes, and chronic kidney disease. Similarly, in our study, pneumonia and urinary tract infection frequently resulted in repeat ED visits among males and patients aged 65 or older. Blank et al.[26] also found that pain-related conditions accounted for 27% of patients that presented to the ED 12 or more times, while Castillo et al.[27] found that frequent ED users often had a primary diagnosis of pain (33.9% of frequent ED users). However, in our study, pain was cited as the principle cause for only 4.3% of the repeat ED visits.

### 2.5.2 Frequent Hospital Admissions

Multiple studies have previously examined risk factors for hospital readmissions.[17-21] A study by Bogaisky and Dezieck found that CKD, CHF, and COPD were associated with greater risk of readmission in community dwellers and nursing home residents.[18] In our study, two of the three most common diagnoses for patients with repeat admissions were CHF and COPD, associated with 26.3% and 17.2% of all inpatient days respectively. As well, while not being one of the three most common diagnoses for repeat hospital admissions in terms of frequency, CKD resulted in the greatest number of inpatient days, accounting for 30.8% of all inpatient days. In particular for CKD, Bogaisky and Dezieck determined that hospital readmission for CKD in community dwellers was significantly higher than the risk of readmission for those in nursing homes (OR = 2.9, 95% CI = 1.9–4.6).[18] Similar results were seen by Barnett et al.[20], where 27.3% of patients with end-stage CKD were readmitted within 30 days of their initial admission.

Seven patients that were included in the study died during the study period. The cause of death was associated with CKD, CHF, or COPD, and these match the most frequent diagnoses of both admissions and inpatient days.

### 2.5.3 Health System Implications

The reasons for frequent ED visits and hospital admissions at SRFH are indicative of gaps in local community-based healthcare services (e.g. dressing changes) and preventable admissions for ambulatory care sensitive conditions.[48] Because this study had its origins in a quality improvement initiative, the findings led to discussions between researchers and SRFH administrators on reducing reliance on the ED for non-urgent care and improving patient care in the community. A systematic literature review by Moe et al.[49] was performed in 2017 to evaluate the effectiveness of interventions targeting adult frequent ED users in reducing visit frequency and improving patient outcomes. They found that interventions targeting frequent ED users were likely to effectively decrease ED visits, improve social outcomes, improve housing stability, and decrease costs.[49] It was also found that some studies reported a minor post-intervention decrease in hospital admissions.[49] Interestingly, it was also discovered that exposure to interventions often led to an increase in the use of outpatient services, rather than a decrease, indicating a potential benefit of linking to outpatient community services.[49] In particular for the community of Smooth Rock Falls, it was recognized that certain patients could benefit from the linkage to community health services[14] such as HLs,[43] CCACs,[44] and CP.[45]

HLs were introduced by Ontario's Ministry of Health and Long-Term Care to improve access to integrated, quality services for Ontario's complex patient population.[43] HLs were designed to "encourage greater collaboration and co-ordination between a patient's

different health care providers as well as the development of personalized care plans. This will help improve patient transitions within the system and help ensure patients receive more responsive care that addresses their specific needs with the support of a tightly knit team of providers" (p.3).[43] Our study contributed to early discussions among hospital administrators related to the development of a local HL in the region.

In Ontario, CCACs were designed as gatekeeping organizations that "coordinate services for seniors, people with disabilities and people who need health care services to help them live independently in the community".[44] The finding that the highest number of ED visits was for dressing changes (33.1% of all ED visits) led to a consultation between the hospital and the regional CCAC provider. A contract was developed and signed for patients to begin receiving nursing services at their homes through CCAC without the need to visit the hospital. However, as of June 2017, CCAC services in this community are now being provided by the NE Local Health Integration Network.[50,51]

CP is a model of care whereby paramedics apply their training and skills in non-conventional community-based environments, often outside the usual emergency response and transportation model.[45] In Ontario, recently-developed CP programs typically include four main components: home visits (HV), community referrals, wellness clinics (WC), and remote patient monitoring.[52] Remote patient monitoring (RPM) includes telemedicine and telemonitoring services. Many similar versions of RPM have been reviewed in multiple studies as a potential option to help reduce hospitalizations and

manage the conditions of patients with COPD,[53-58] CHF,[58-61] or diabetes mellitus.[62, 63] From our study, 14 patients were identified who would potentially benefit from RPM. These patients were then assessed for RPM eligibility, and a few patients were subsequently enrolled in the service.

CP HVs are types of in-home care where paramedics visit patients in their place of residence, often on request from a physician or other providers, including post-hospital discharge planners. HVs often also have a health promotion focus, where paramedics might conduct home safety inspections or other wellness assessments. Implementation of CP HVs were recommended to the SRFH administrators, since several patients from our study were appropriate candidates for this service. Additionally, multiple studies on CP programs have shown reductions in calls to EMS,[64-67] reductions in hospital ED visits and admissions,[67-69] an improvement in the management of chronic conditions like high blood pressure,[64,65,68] CHF, and COPD,[67] an improvement in health status and quality of life,[65,70] and cost savings to the health care system.[64,66,67,71]

With CKD identified as one of the most frequent reasons for repeat hospital admissions, and the greatest contributor to inpatient days, it was significant that there were no local dialysis services available in the community. Patients with CKD travelled approximately one-hour, multiple times per week, to the nearest hospitals in Timmins (101km away) or Kapuskasing (65km away) for their dialysis treatments. This finding encouraged health care providers to consider exploring opportunities to improve local care options to

support patients with kidney disease. According to the Ontario Renal Network, options include home dialysis, and support services from the CCAC.[72] There are many reported benefits of home dialysis, including fewer and shorter hospital stays, longer life expectancy, increased independence of patients, decreased need to travel for treatment, and overall improved quality of life.[73]

The results of this study led to the development of a *Quality Best Practice* program at the SRFH, an initiative to support standardized quality-based order sets (checklists) for different diagnoses. The goals of the *Quality Best Practice* program are to: (1) provide consistent quality care for patients, and (2) decrease likelihood of readmission.

### 2.5.4 Limitations and Future Research

There are certain limitations related to this study that require consideration; however, some are also opportunities for future research. First, the findings are limited to the hospital and community studied and possibly not generalizable to other small hospitals. However, the methodology of this study could be applied to other small rural hospitals when performing data-driven quality improvement initiatives in order to optimize health care services for the communities they service.

Second, our study was not able to confirm if the listed reason for the ED visit was the same as the diagnosis provided by the physician. Since International Classification of

Diseases, Tenth Revision, (ICD-10)[47] coding was not used for every ED patient visit, there may have been classification errors and it is possible that specific diagnoses may not have been properly charted. For example, a patient could initially present with a wound that is charted as cellulitis. This wound then requires intravenous antibiotics and frequent dressing changes. Thus, it is possible that the initial ED visit was charted as either a wound or cellulitis and then the follow-up ED visits were charted as intravenous antibiotics or dressing changes, despite still being for cellulitis. This could cause an overlap in some of the causes of frequent ED visits and may have created skewed results. In addition to the possibility of misclassification, there could also be the possibility of *upcoding* in which billing codes were purposefully miscoded to result in a larger reimbursement.[74-76]

Third, it is also important to note that our study focused solely on determining the reasons for repeat ED visits or admissions, and we did not look at the overall utilization of hospital services or the impact of frequent users on ED wait times or other service availability. These are important variables identified by others, such as Doupe et al.[9] in their study examining frequent ED users and should be replicated in a future study. Fourth, our study did not evaluate any economic impacts or patient satisfaction with hospital services. However, it would be interesting to determine if these high hospital utilization patients would prefer to be seen in a community health clinic or by a community health nurse, rather than in the ED.

Finally, this study was unable to differentiate between physician-initiated ED visits and patient-initiated ED visits. This is important because a case can be made that most of the physician-initiated ED visits would be for follow-up or non-urgent issues, and this could support the need for other health services in the community to reduce these types of visits. It also potentially reflects the fact that in this small rural community, a single physician covers both the ED and the clinic, and that the physician may prefer to see certain non-urgent patients in the ED because of the availability of space, equipment, staff, and other resources; as well there may be a motivation to reduce wait times for a clinic appointment.[30] For instance, it is possible that a physician advised patients to return to the ED for dressing changes or go to the ED for wart removal where procedural supplies are more readily available. Further research in this area could confirm this speculation.

## 2.6 Conclusion

This study identified the most common reasons for repeat patient ED visits and repeat hospital admissions, and the findings led to a productive dialogue about optimizing health services to meet the needs of patients in one rural NE Ontario community. Specifically, this study led to increased patient referral for CP services, data-driven HL planning in the region, and the signing of a contract with the CCAC to increase home care services targeting dressing changes and antibiotic treatments.

Future studies at the SRHF could determine whether: (1) the quality of care improved for any of the patients from our study who were diverted to alternative care services in the community; and (2) there are any utilization changes in terms of ED visits and hospital admissions. Other small rural hospitals could benefit from initiating similar data-driven quality improvement initiatives in order to optimize health care services for the communities they service.

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# Chapter 3

## 3. Patient experiences related to community paramedicine programs in Northern Ontario, Canada

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### 3.1 Abstract

**Background:** It is known that populations aged 65 and older in rural communities across Northern Ontario, Canada, must overcome many challenges when accessing health care services. To address these challenges, the Ontario Seniors Strategy recommends community paramedicine (CP), an innovative health care service provided by paramedics not engaged in emergency response. The goal of CP is to address gaps in community-based health services and provide patients with an alternative to calling emergency medical services. This study aimed to evaluate patient and caregiver perspectives related to their involvement in three CP programs in rural communities across Northern Ontario. There were two research questions guiding the evaluation of patient perspectives in this study: (1) How effective is CP at supporting patient-centered care; and (2) How do perceptions differ between HV and WC patients?

**Methods:** This study involved the development, implementation, and analysis of a self-report survey instrument that was designed to obtain patient and caregiver perspectives related the CP services on the experiences of patients involved in HV or WC in three CP pilot projects in Northern Ontario. The analysis was guided by the components of the Patient-Centered Care Framework developed by Greene, Tuzzio and Cherkin to determine if CP fosters patient-centered care.

**Results:** A total of 60 completed surveys were returned by elderly patients enrolled in a CP program. Overall, 91.7% (n=55) of patients reported being satisfied with the CP services they received and 98.3% (n=59) of the patients indicated that they would recommend CP to others. Both HV and WC patients reported positive perceptions in regard to the services that they received, with HV patients being particularly grateful for the services provided to them at their home. Patient perspectives of CP suggest that the service model is consistent with a patient-centered framework that includes interpersonal, clinical, structural, and psychosocial dimensions. The patients described positive relationships with the paramedics and viewed the paramedics as caring, friendly, and professional health service providers. Paramedics were seen as healthcare system navigators and patient advocates. The patients also valued CP for the ease of access and the reassurance provided by the paramedics monitoring their health concerns.

**Conclusion:** Early signs suggest that from an elderly patient perspective, CP is an acceptable and accessible program that appears to help improve the patient experience in

rural communities across rural Northern Ontario. Future research with a larger sample of patient perspectives is required to confirm this assertion.

## 3.2 Background

The province of Ontario, Canada, is currently faced with the challenge of an aging population and an increase in health care needs.[1] In 2011, patients aged 65 and older comprised 14.6% of Ontario's population and required care and services accounting for nearly half of all health care spending.[2-4] This elderly population has continued to increase, comprising 16.9% of Ontario's total population in 2016,[5] and is expected to reach 25% of the entire Canadian population by the year 2036.[4] Thus, there is an increasing need for innovative and cost-effective models of care for seniors in Ontario. This need becomes even more compelling in rural, remote and northern communities, which comprised 14% (n=1,800,000) of Ontario's population in 2011[6] and are generally made up of a higher proportion of seniors.[7]

Patients in rural communities often encounter obstacles when it comes to the availability of physicians, nurses, and other health care providers.[8,9] Not only is the health of those patients residing in rural communities typically worse than those living in urban communities,[9] but they also have access to fewer health care services.[7, 10] Many rural communities lack services such as health promotion, diagnostic imaging, emergency care, acute and non-acute care.[8] Since vulnerable populations, such as seniors, require

additional services to meet their needs,[8, 11] access issues present additional challenges for them in seeking the services that they need.[7] These challenges are also observed in remote Indigenous communities, where health and well-being is being continually challenged due in part to multigenerational trauma from inequities related to the social determinants of health.[12]

In order to help address these needs and challenges, the Ontario Ministry of Health and Long-Term Care (MOHLTC) supported the expansion of CP, a new and innovative model of care, through the funding of pilot projects in 30 paramedic services across Ontario in 2014.[13] Community paramedicine (CP) provides patients with an alternative to calling dispatch for emergency services[4] by diverting patients with non-urgent needs from the emergency department (ED) in hospitals.[14-21] CP programs in Ontario offer services that typically include: (1) home visits (HV); and (2) wellness clinics (WC).[22, 23] HVs were primarily designed for elderly patients who frequently called emergency medical services (EMS) and used ED services. During a HV, paramedics monitor a patient's health and living status in their place of residence in order to provide care, education, and/or a referral to other services.[23] WCs involve paramedics hosting health clinics during scheduled days/times at convenient locations such as senior housing complexes and community centres. During a WC, paramedics provide health education as well as patient specific services such as monitoring blood pressure.[23] Additionally, CP services often involve other supportive services such as referrals to and from other health professionals and remote patient monitoring.[23,24] The provision of these types of CP

services has received high profile support from sources such as: (1) the 2012 *Report to the Ministry informing a Seniors Strategy in Ontario*[3]; and (2) *Community Paramedicine in Canada* (White Paper) by Nolan et al.[4] on behalf of the Paramedic Chiefs of Canada.

Many CP programs have been evaluated and contribute to the growing body of literature.[15-22, 25-29] Multiple studies on CP programs across have shown reductions in calls to EMS,[17,18,20,21] reductions in hospital ED visits and admissions,[15,16,20] an improvement in the management of chronic conditions like high blood pressure,[15,17,18] congestive heart failure, and chronic obstructive pulmonary disease,[20] an improvement in health status and quality of life,[12,18] and cost savings to the health care system.[17,19-21] Recently, a study on a CP program in Southern Ontario discovered three common themes that were present while evaluating participants' perceptions of the services they received: caring and trusting relationships, paramedics as health advocates, and the added value of EMS skills.[28] Beyond this study, the literature related to participant perspectives in CP programs is limited. There is a need to collect additional information related to participants' experiences[28] in order to inform and improve CP practices.[30]

This need is also reflected in the MOHLTC's strategy that highlights the importance of having a patient-centered system focused on improving access, connecting services, informing patients, and protecting the universal health care system.[1] An effective way to foster patient-centered care is by responding to individual patient preferences, values, needs, and goals.[31] This approach is important in order to move towards an autonomy-

based patient-centered model rather than a beneficence-based provider-centered model.[32] Thus, the MOHLTC strategy would benefit from patient perspectives to identify how the health care system could be improved.[1]

The literature provides a variety of frameworks available to guide patient-centered care. These frameworks often consist of multiple dimensions. Greene et al.[31] summarized the literature and identified three dimensions of a Patient-Centered Care Framework (PCCF) that must be present and integrated by health care providers when making patient-centered care part of the culture of care. Table 3-1 portrays the three dimensions, as well as explanations of the attributes of the PCCF.

**Table 3-1 - Summary of dimensions and attributes of the Patient-Centered Care Framework**

| Interpersonal dimension (relationship) | Clinical dimension (provision of care) | Structural dimension (system features) |
|---|---|---|
| **Communication** | **Clinical decision support** | **Built environment** |
| • Begins with listening.<br>• Creates a fabric of trust.<br>• Promotes clear, empathic communication, tailored to patients' needs and abilities.<br>• Welcomes participation of family, friends, and caregivers. | • Ensures shared decision making on the basis of best-available evidence coupled with patient preferences.<br>• Supports self-management. | • Provides calm, welcoming space.<br>• Accommodates patient, clinician, and family needs.<br>• Emphasizes easy "way-finding" and navigation through the system. |

| Knowing the patient | Coordination and continuity | Access to care |
|---|---|---|
| • Uses knowledge of patient as a whole and unique person for effective interactions.<br>• Finds common ground on the basis of patient preferences.<br>• Facilitates healing relationships. | • Manages care transitions and seamless flow of information – whether for a broken arm or life altering illness.<br>• Coordinates with community resources. | • Eases appointment-making process.<br>• Minimizes clinic wait times.<br>• Payment system accommodates patients' circumstances.<br>• Coordinated, consistent, efficient. |
| **Importance of teams** | **Types of encounters** | **Information technology** |
| ● Ensures responsiveness by entire care team to patient and family needs.<br>● Recognizes that actions of both clinicians and staff can influence perceptions of care. | • Accommodates virtual visits (phone, e-mail) as well as in-office visits.<br>• Reimbursement structure supports range of encounters that meet patients' varied needs. | • Supports patient and clinician before, during, and after encounters.<br>• Tracks patients' preferences, values, and needs dynamically.<br>• Provides self-management tools and information. |

Information retrieved from: Greene SM, Tuzzio L, Cherkin D. A Framework for Making Patient-Centered Care Front and Center. The Permanente Journal. 2012;16(3):49-53.

The purpose of our study was to evaluate patient and caregiver perspectives related to their involvement in CP pilot programs in Northern Ontario. There were two research questions guiding the evaluation of patient perspectives in this study: (1) How effective is CP at supporting patient-centered care; and (2) How do perceptions differ between HV and WC patients?

## 3.3 Methods

This study involved the development, implementation, and analysis of a self-report survey instrument that was designed to obtain patient and caregiver perspectives related the CP services they received. We evaluated how well CP provided patient-centered care through the lens of the PCCF developed by Greene, Tuzzio and Cherkin.[31] This framework was selected for this study because it was comprehensive and well supported in the literature.[33-35]

### 3.3.1 Population and Setting

This study focused primarily on the experiences of patients involved in HVs or WCs since these services were the main components of the CP pilot projects in Northern Ontario. The CP programs providing these services were coordinated by three EMS in Northern Ontario: the Cochrane District EMS CP, the Rainy River District EMS CP, and the Superior North EMS CP. These three CP programs were classified into the north east (NE) Ontario (Cochrane District EMS) and the North West (NW) Ontario (Rainy River District EMS and Superior North EMS) for analysis.

Within these three programs, a total of 17 rural communities, and one urban community, had patients that were involved in the CP programs. For this study, rural communities were defined as those communities with a population less than 30,000 and that are

located 30 minutes or more in travel time from a community with a population greater than 30,000.[36] Table 3-2 contains characteristics of the EMS providers.

**Table 3-2 - Characteristics of the EMS providers in NE and NW Ontario.**

| Region | EMS Provider | Total Population† | Total Francophone¶ | Total Seniors (Aged 65+)§ | Paramedics implementing CP services‡ | Number of patients in the CP programs†† |
|---|---|---|---|---|---|---|
| NE Ontario | Cochrane | 14,136 | 9,100 (64.4%) | 3,070 (21.7%) | 100 | 174 |
| NW Ontario | Rainy River; Superior North | 134,293¶¶ | 3,530 (2.6%) | 26,885 (20.0%) | 232 | 309 |

† Based on Statistics Canada 2016. Census data includes that of the 17 CP pilot sites. Total population does not represent the population of the entire EMS catchment area which may include other communities.
¶ Percent who selected French as mother tongue, from Statistics Canada 2016 Census.
§ Statistics Canada 2016 Census data of age characteristics. Sum of those aged 65 and over.
‡ This includes full-time and part-time paramedics.
†† Estimation by EMS providers of patients enrolled in the CP programs between April 1, 2015 and June 30, 2016. Patients were enrolled in the CP program based on a request or referral from a health care provider, family member, or by self-referral.
¶¶ Includes the urban City of Thunder Bay.

### 3.3.2 Survey Instrument Design and Development

Patient (Appendix B) and caregiver surveys (Appendix C) were both developed and refined from draft questions initially provided by the MOHLTC and other sources such as CP and other health-related literature. The survey included a combination of demographic, Likert-type, and open-ended questions. Most of the Likert-type scale response categories were: strongly agree, agree, disagree, strongly disagree, and do not

know/not applicable. To meet the needs of all patients and caregivers in the study, French versions of the surveys (patient and caregiver) were created, and then they were subject to a forward and backward translation process to ensure validity between concepts.[37, 38]

### 3.3.3 Participants and Recruitment

Participants eligible for participation were patients, or their caregivers, who were involved in one of the three CP programs. Patients' affiliation with the CP program arises from either a referral through the Circle of Care program in their community, through recruitment directly from community paramedics themselves, or through recruitment from family or friends. Patients had the opportunity to participate in either HV, WC, or both services, and this was decided at their discretion. While all CP services can be offered to any patient in need, regardless of age, the CP programs studied targeted patients over the age of 60, due to approximately 55% of ambulance calls in those regions resulting from that age group.[23]

For the purpose of this study, participants were recruited through the use of a "Consent to be Contacted" (CTBC) form (Appendix D) that was distributed by paramedics during a HV or at a WC. Caregivers (i.e., family members, friends,) of patients were also included in this study so as not to exclude the experience of patients that may not have been able to participate or complete the survey without help due to illness, cognitive impairment, or for other reasons. The term patient was used in this study to describe all patients including those who self-identified as clients or participants rather than patients.

### 3.3.4 Data Collection

Patients who were interested in learning more about the study completed the CTBC and returned it to the research team by mail in a pre-paid return envelope. Patients were sent a survey package by mail after waiting three to six months, in order to allow for a prolonged experience with the CP program. The survey package included an invitation to participate letter, an information and consent form, a copy of their signed CTBC form, the survey questionnaire in the language that they selected on their CTBC form (i.e., English or French), and a self-addressed postage paid return envelope. Patients were then contacted by telephone or email two weeks after the mail-out to verify if they had received the survey and to answer any questions. A data entry form was developed using the REDCap™ [39] secure web application, and responses were manually entered. All questionnaires were then reviewed to ensure accuracy and exported to Microsoft Excel and SPSS™ [40] for analysis. The study was approved by the Research Ethics Board at Laurentian University on March 22, 2016 (REB Number 2015-02-06). Appendix E contains a copy of this approval.

### 3.3.5 Data Analysis

Descriptive statistics were used to explore sample characteristics, patient perspectives and the differences between HV and WC patients. Fisher's Exact analyses were computed to examine the relationship between services received (HV vs. WC), and

perceived physical and mental health status. When comparing relationships between services received, patients who received both services were excluded from the analyses.

Responses to open-ended questions were analysed following the principles of modified analytic induction[41] to determine if they were reflective of the dimensions and attributions of the PCCF. The principal investigator (CRP) analyzed each open-ended response initially, and a second member of the research team (JES) reviewed and re-analyzed the responses to verify and confirm the interpretation.

## 3.4 Results

A total of 119 CTBC forms were received and survey packages mailed with seventy-one (71) surveys returned. There were only four caregiver surveys and all were excluded to protect the identity of the respondents, since it appeared that very few of the participants in the CP programs had caregivers and the possibility of patient identification could have been increased. Seven patient surveys were excluded due to being largely incomplete. Surveys that had very few incomplete questions were still included in the analysis. This yielded 60 patient surveys available for analysis. Therefore, it is important to note that analyses will be representative of all participants that completed that particular question of the survey, and not the overall population of participants. As well, analyses comparing HV services and WC services included only patients receiving one type of service (n=57). The mean age of patients was 75.6 years (SD = 8.52) and 66.7% (n=40) were

female. Thirty-four (56.7%) patients self-identified as Anglophone, 20 (33.3%) as Francophone and six (10.0%) as bilingual. Thirty-four (56.7%) patients were from the NE region while the remaining patients were from the NW region (n=26). Eighteen (30.0%) patients participated in HVs, 39 (65.0%) patients participated in WCs, and three (5.0%) patients received both services. The majority of WC patients were from NE Ontario (84.6%, n=33) while the majority of HV patients (or a combination of HV and WC) were from NW Ontario (95.2%, n=20).

Overall, 91.7% (n=55) of all patients were satisfied/very satisfied with the services and CP care provided by the paramedics. Fifty-seven patients (98.3%) also indicated that they would recommend CP services to others. When comparing HV and WC patients, 100% (n=18) of HV patients and 87.2% (n=34) of WC patients were satisfied/very satisfied with the services and care they received. Nearly all patients (HV: 100%, n=18; WC: 97.3%, n=36) indicated that they would recommend the CP program to others.

Self-reported health status varied significantly by CP component. Results indicated that 55.6% (n=10) of patients who are only receiving HV services perceived their physical health as poor/fair and 16.7% (n<5) perceived it as very good/excellent, compared to 21.1% (n=8) and 39.5% (n=15) of WC patients that perceived their physical health as poor/fair or very good/excellent, respectively (Fisher's Exact = 6.518, p=0.04). Of the patients receiving HV services, 33.3% (n=6) perceived their mental health as poor/fair and 38.9% (n=7) perceived it as very good/excellent, compared to 2.6% (n<5) and 65.8%

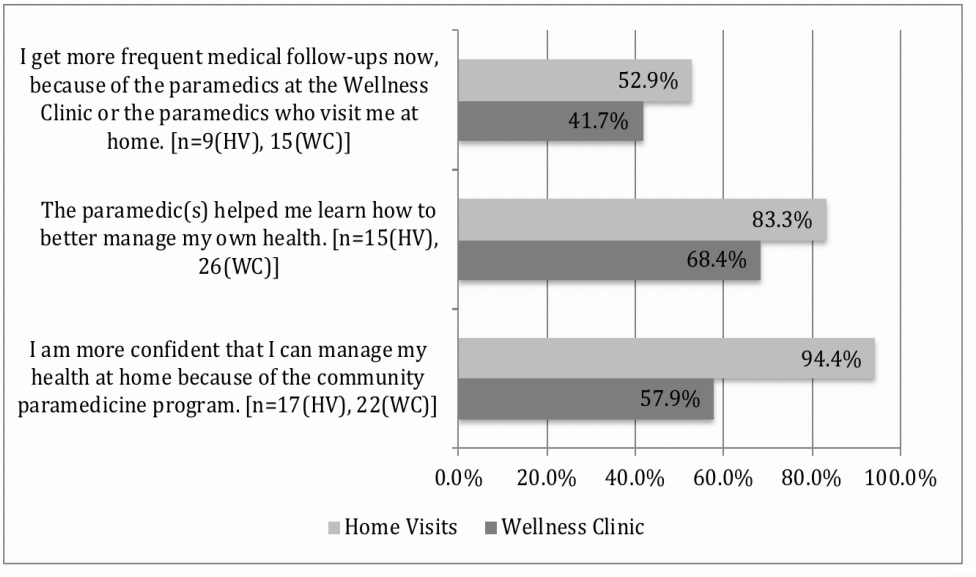
(n=25) of WC patients that perceived their mental health as poor/fair or very good/excellent, respectively (Fisher's Exact = 9.718, p=0.006).

The following sections present the findings related to the three dimensions of the PCCF, clinical, structural, and interpersonal. A fourth section summarizes additional psychosocial benefits related to CP; this theme emerged inductively from the data. It is important to note that these psychosocial benefits are separate and distinct from the interpersonal dimension of the PCCF, primarily because they are not reflective of a patient-provider relationship. There was a total of 200 responses received and analyzed from five open-ended questions.

### 3.4.1 Clinical Dimension

From a clinical perspective, patients were asked questions about the perceived impacts of the CP program on their health, with an emphasis on their ability to remain in their home and/or in their community while receiving care. Compared to WC patients, a higher percentage of HV patients stated that they agree that the CP program increased their confidence in managing their own health at home; that CP paramedics helped them learn how to manage their own health; and that they received more medical care as a result of CP (Figure 3-1).

**Figure 3-1 - Percentage of patients that agreed or strongly agreed to statements related to the clinical dimension.**



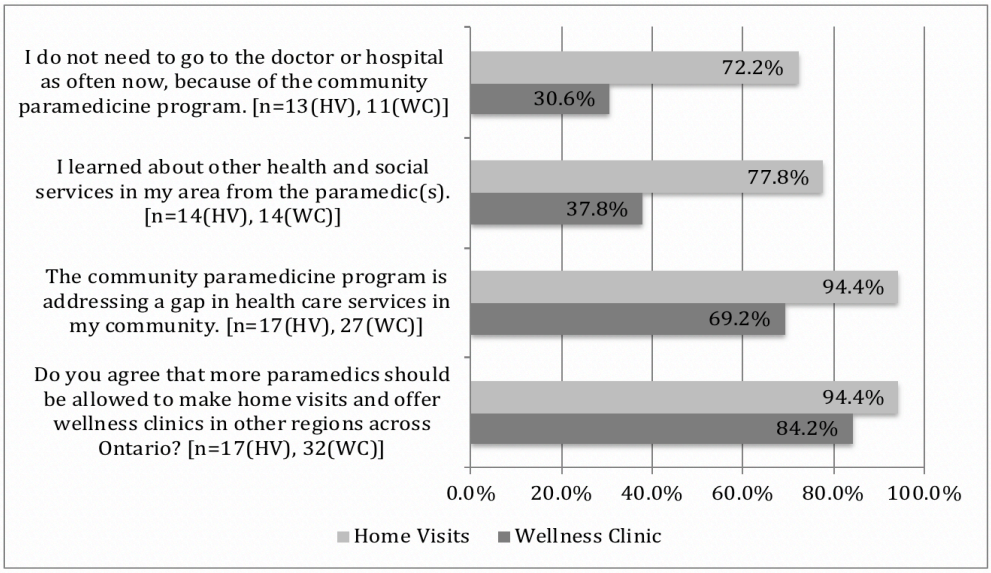

Open-ended comments related to the clinical domain were relatively few compared to the other domains. Prevention was the most common focus, with one patient commenting *"I find it keeps me on an even balanced lifestyle"* (Patient 046, Male, HV), and another stating "*These visits help prevent serious problems"* (Patient 108, Male, WC).

### 3.4.2 Structural Dimension

The structural dimension includes aspects such as the built environment and access to care. Again, compared to the WC patients, a higher percentage of HV patients stated that they agreed that the CP program reduced their need to go to the doctor or hospital; that

they had learned about other health and social services in the community from paramedics; and that CP was addressing a service gap in their community (Figure 3-2). One question asked patients whether they thought paramedics should be allowed to conduct HVs and WCs beyond the pilot communities to other regions in Ontario; with 87.5% (n=50) of all patients agreeing.

**Figure 3-2 - Percentage of patients that agreed or strongly agreed to statements related to the structural dimension.**




In the open-ended comments, patients indicated further benefits related to having CP paramedics help them navigate the healthcare system. Patients reported that the paramedics provided additional information related to other healthcare services in their community, with one patient explaining: "*Very good. Helps persons who don't know*

*what is out there to help and how to use the services that are there to help.*" (Patient 058, HV, Female). For HV and WC patients alike, the ease of access was an important benefit of the program. One patient explained how the CP model facilitated their access to care:

> *The convenience of having them come to my home. Sometimes too sick or tired to go out (my age against me). Do not drive... [there was the] comfort of knowing someone was coming to my home to check up.* (Patient 055, HV, Female).

Some patients were not only relieved that they no longer had to go to the ED or doctor's office for minor issues, but also perceived that there were cost benefits to the system and to themselves.

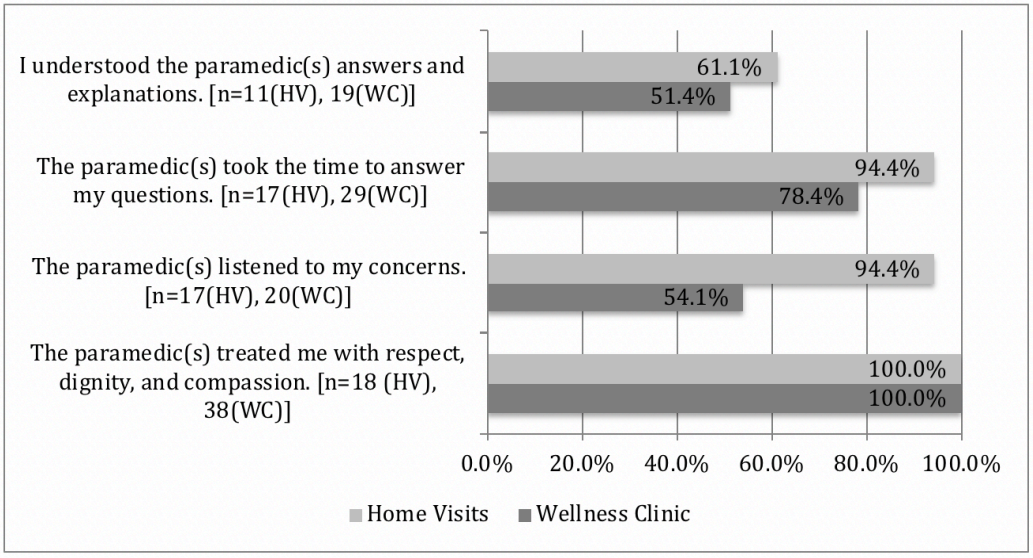
> *Many elders are not well enough to go to the doctor's office and wait for an hour and their problems are chronic and all they need is some monitoring. This service is also cheaper than a visit to the doctor.* (Patient 001, WC, Female).

### 3.4.3 Interpersonal Dimension

The interpersonal dimension focused on the paramedic-patient relationship. Every HV patient and every WC patient reported that the paramedic(s) treated them with respect, dignity, and compassion (Figure 3-3). When compared to WC patients, more HV patients also agreed that they understood the paramedic(s) answers and explanations, the

paramedic(s) took the time to answer their questions, and the paramedic(s) listened to their concerns.

**Figure 3-3 - Percentage of patients that agreed or strongly agreed to statements related to the interpersonal dimension**




In the open-ended comments, patients indicated high levels of trust and appreciation for the paramedics. Many of the patients felt that the paramedics gave them the time they needed to be able to express themselves, provided explanations as needed, and were friendly, polite, caring, and professional. Some patients described how CP enabled the paramedics to see the whole person, and not just an illness, as indicated when one patient mentioned that the paramedics "*listened to me and validated me and took the time to talk to me*" (Patient 055, HV, F)

Particularly for HV patients, CP seemed to enable the paramedics to acquire more knowledge of their patients, in turn ensuring that patients received the assistance that they needed. As well, some respondents even contrasted CP with the rushed care they received at their physician's office.

Patients also described how the paramedics served as health advocates for their patients. In particular, the paramedics seemed to act as an intermediary between the patients and their primary care providers. As explained by one patient, *"I had bad swelling of the feet and [one] hand. Paramedic sent notice to doctor who phoned me and put me on a water pill that reduced the swelling"* (Patient 054, HV, Female). This is significant given the challenges described in seeing the physician (mobility challenges; long wait times for appointments) and reluctance to "bother" a busy physician with perceived minor complaints. In this particular case, it was also significant because the outcome was improved mobility and health conditions for the patient.

### 3.4.4 Psychosocial Benefits

Beyond the three dimensions of the PCCF, CP seemed to have a valuable psychosocial aspect as reported in the open-ended comments of the survey. One item was included on the survey to assess the impact of CP on social connectedness: 100% of HV patients (n=18) and 82.1% of WC (n=32) patients agreed with the statement that CP "makes me feel more supported and connected in the community". Given the potential recognized

health benefits of social inclusion and connectedness which could help prevent repeat ED visits,[42,43] it was deemed an important outcome. In addition to improving social connectedness, many patients reported that the CP services helped reduce anxiety, provided reassurance and/or an increased sense of security, and gave them peace of mind.

However, patients elicited certain concerns about the program when they heard of potential funding cuts. This was especially the case in the NW Ontario region, where the CP programs stopped for a short period of time due to lack of funding, to which one patient commented: *"The government always cuts good programs but spends millions on un-important things*" (Patient 054, Female, HV). Another patient expressed a similar concern by stating: *"There is nothing I didn't like about the program other than it wasn't around long enough… I do know I valued it and would like it back*" (Participant 055, HV, Female). Concerns were also raised when paramedics had to leave a WC when paramedics needed to respond to an emergency call. However, the majority of patients seemed to understand the obligation to prioritize emergency calls, as mentioned by one patient: *"Patients understand that the paramedics might have to sometimes leave or miss a clinic due to an emergency call"* (Patient 083, Female, WC). It is important to note, that unlike a typical CP program that employs specialized paramedics trained in CP, these three CP programs utilize paramedics while on regular or modified duty.

For isolated HV patients, visits also increased the amount of social interaction they had. As one patient described, he "*looked forward to having* [the paramedics] *come to give me*

*some answers instead of waiting for a long time to see the doctor, get an appointment, etc. They eased my mind.*" (Patient 055, Male, HV). Overall, the psychosocial aspect appears to be an important component of CP because it seemed to contribute to an improvement in quality of life for the patients and helped maintain independence for those living alone.

## 3.5 Discussion

This study explored patients' perspectives related to the care they received through their involvement in three pilot CP programs that were designed and implemented for rural communities across Northern Ontario. Although these CP programs were new initiatives, patients enrolled in the programs voiced positive opinions about their experiences and the majority of the patients were satisfied with the services and care provided by the CP paramedics.

The findings indicated that the majority of patients receiving HVs had a lower self-reported physical and mental health status (16.7% (n<5) and 38.9% (n=7) respectively) than the reported physical and mental health status (39.5% (n=15) and 65.8% (n=25) respectively) of patients participating in WCs. Despite this, the outcomes for improving health status are favourable for CP participants, since it has been observed that CP programs can help with an improvement in overall health status.[12,15,17,18] However, as a comparison in 2014, 59.2% and 70.4% of Ontarians respectively perceived their physical

and mental health as very good or excellent.[44]

### 3.5.1 Comparison of home visit and wellness clinic services

The majority of the feedback received from participants indicated that the CP program was appreciated. In fact, all HV patients, and almost all WC patients were either satisfied or very satisfied with the CP services that they received. When comparing both HV and WC patients, there were differences in terms of appreciation and benefit. While there were many positive reviews overall, it appeared that the HV patients perceived more benefit more from CP when learning how to manage their own health, particularly at home. This cohort of patients also expressed that they required an increase in medical care received compared to the WC patients. Compared to the WC patients, a higher proportion of HV patients also believed that the CP program reduced their need to go to the doctor or hospital; that they had learned about other health and social services in the community from paramedics; and that CP was addressing a service gap in their community. Again, when compared to WC patients, more HV patients also agreed that they understood the paramedic(s) answers and explanations, the paramedic(s) took the time to answer their questions, and the paramedic(s) listened to their concerns. Particularly for HV patients, CP seemed to enable the paramedics to acquire more knowledge of their patients, and this likely ensured that patients received the assistance that they needed. Some respondents even contrasted CP with the rushed care they received at their physician's office. However, the findings indicated that the majority of

patients receiving HVs had a lower self-reported physical and mental health status when compared to patients participating in WCs. It is possible that this difference in health status is what made the CP program to appear more beneficial for the HV patients.

### 3.5.2 Limitations

One limitation of this comparative analyses is the imbalance of service components (HV and WC) between the geographic regions (NE Ontario and NW Ontario). Nearly all HV patients were in the NW Ontario, while the majority of the WC patients were in NE Ontario. As pilot projects, the EMS providers were free to develop their programs as they saw fit,[23] and in the early stages, they may have focused more on one component instead of trying to implement both at the same time. Nonetheless, there was no evidence that the patient populations served by the different CP programs were significantly different. Unfortunately, the geographic imbalance in these results limits our ability to definitively interpret comparisons of self-reported health between services (HV vs. WC) or between regions (NE Ontario vs NW Ontario). However, it is possible that those receiving HV services were unable, or found it too difficult, to attend the WCs, due to mobility impairments or other issues, which would have increased the proportion of HV patients with a poor health status. Given the small heterogeneous sample in this study of a newly launched program, it is not possible to definitively determine whether the program components were able to target/reach the appropriate patients.

Additional limitations include the generalizability of the study results beyond the three programs included. The small sample in this study was due to the complex recruitment process designed to protect patient confidentiality and anonymity. It was also difficult to determine the total population of CP patients in Northern Ontario at the time of the study since reports back from the three EMS providers suggested that the patient record system was challenging to use, and not all patient interactions at HVs and WCs were recorded. Another limitation could be related to participation bias, where some participants may have had difficulties in completing the survey due to a physical or cognitive impairment. While we attempted to control for this limitation by providing caregivers an opportunity to respond to the survey, less than five caregiver surveys were received and were excluded from the analysis to protect the identity of the respondents. It is also important to note that the CP programs in Northern Ontario were fairly new, and some patients had limited exposure and interactions with paramedics and the program; the majority receiving HVs or attending WCs less than five times. This study also did not evaluate systemic implications of CP related to hospital ED visits, calls to dispatch for emergency services, and overall economic impact on health care, which are types of evaluations that are also suggested in the CSA Z1630 *Community Paramedicine: Framework for Program Development* standard by the CSA Group.[45] As well, the CP programs studied were not developed in close collaboration with Indigenous Peoples in remote communities.[12] Therefore, further development should be conducted with remote Indigenous communities to foster a CP model that can be adapted for the needs of Indigenous peoples, particularly in areas where there are no current paramedic services.[12]

Nevertheless, despite these limitations and small sample size, these results provide encouraging early signs that from an elderly patient perspective, CP is an acceptable and accessible program that appears to be helping improve the patient experience in communities across Northern Ontario. Most of the responses from the open-ended and quantitative data were positive related to patient perception of their CP experience, and the data also revealed that there was an important psychosocial aspect of the patient experience that was not represented in the PCCF.[31]

### 3.5.3 Patient-Centered Care

Overall, the combined perspective of all patients was compelling. Patients frequently indicated high levels of trust and appreciation for the paramedics. Many of the patients indicated that the paramedics gave them the time they needed to be able to express themselves, provided explanations as needed, and were friendly, polite, caring, and professional. Some patients also described how CP allowed for the paramedics to see the patient as a whole person, and not just an illness. These results are similar to a study of a CP program in Southern Ontario by Brydges et al.[28] that discovered three common themes that were present while evaluating participants' perceptions of the services they received: caring and trusting relationships, paramedics as health advocates, and the added value of EMS skills. The information collected in this study also helps bridge a gap in informing and improving CP practices that was previously mentioned in the literature.[28,30]

**Clinical dimension.** The clinical dimension supports attributes of the PCCF that were reflected through paramedics helping patients improve their self-management abilities by providing them with additional resources. In fact, the majority of the patients agreed that the paramedics helped them learn how to better manage their own health, and this was particularly apparent with the HV patients who strongly felt that the self-management of their health conditions while at home was improved due to the CP program.

One possible explanation for this is that with the poorer health status reported by HV patients, they had greater needs for CP services than WC patients. Another possible explanation is that the extra time spent at a patient's residence may have allowed paramedics to provide additional services such as fall prevention assessments, blood pressure monitoring, and assessment of conditions of daily living.[23] Without proper knowledge of their own conditions or necessary resources, self-management of medical conditions at home has been an issue for many patients.[42] However, multiple CP programs have reported benefits for self-management of medical conditions including high blood pressure,[15,17,18] congestive heart failure, and chronic obstructive pulmonary disease.[20] The additional assessments and resources that were provided by the CP program could thus potentially reduce utilization of other health services, such as hospital ED visits and admissions.[15,16,20,21] With their knowledge of community resources and their ability to act as an advocate for their patients, the CP paramedics seemed to be able to coordinate the care of many patients, including referrals to other community resources to assure that they receive the care they need.[21,28] This may contribute to some patients'

ability to remain in their home and/or in their community while receiving CP services and referrals, despite some of the challenges that patients brought up such as mobility issues and long wait times for appointments.

**Structural dimension.** Both the HVs and the WCs reflected calm and welcoming spaces that allowed patients to receive the care they needed in either their homes or at a convenient location, and this directly helped improve their access to care. This was especially appreciated by the HV patients who often commented on how the services accommodated their needs and helped improve their access to the services they required.

CP services also improved access simply by providing two additional health care services (HVs and WCs) that were simply not available prior to the program launch. CP also improved access by making patients more supported and aware of other resources in their communities, helping them better navigate the health care system which is an important concept for fostering patient-centered care.[1] Having knowledge of additional services in a community can allow health care providers to divert patients with non-urgent illnesses away from the ED, reducing the chance of a repeat visit or admission. While this study did not determine if the CP services decreased the rates of repeat visits or admissions, it has been previously reported that other CP programs have reduced hospitalizations.[4,15,16,20] As well, a previous study in the same region as one of the CP programs (Chapter 2) determined that a large proportion of repeat ED visits and hospital admissions were preventable by referring the patients to other health services in their

community, such as CP or remote patient monitoring.

**Interpersonal dimension.** All three attributes of the interpersonal dimension (communication, knowing the patient, and importance of teams) were supported by the responses from open-ended questions in our study. A recent qualitative study on CP patients' perceptions of paramedics also reinforced the importance of the interpersonal dimension reflected in three themes: caring and trusting relationships, paramedics as health advocates, and the added value of EMS skills.[28] Similarly, our study supported the acceptability of paramedics offering CP services to patients.

Findings from our study also confirmed that paramedics utilized their EMS skills to foster trusting and respectful relationships with the purpose of acting as health advocates for their patients. From a patient perspective, paramedics seem to have the capacity and versatility to provide non-urgent care (i.e. CP services), and could perhaps make effective decisions regarding patient care needs in the community.[14] In addition to having the necessary skills and abilities to provide certain medical procedures[46-49], there is evidence that paramedics are effective in applying health promotion strategies[12,27, 48] and referring patients to other community health programs.[50] In our study, it was noted that the paramedics fostered clear and empathic communication between themselves and their patients. However, 94.4% (n=17) of HV patients, compared to the WC patients (54.1%, n=20), agreed that the paramedics listened to their concerns. Given the time difference in the length of encounters between HV and WC with paramedics, it is understandable that

HV patients indicated greater agreement with statements about paramedics' listening to their concerns, taking the time to answer questions, and understanding paramedics' answers and explanations.

**Psychosocial dimension.** Beyond the three dimensions of the PCCF, there seemed to be important psychosocial benefits related to the CP experience of the patients. These benefits included: enhanced social interaction, reduced anxiety, increased sense of security and reassurance, and peace of mind. Many of the patients surveyed in our study appreciated the subsequent reassurance, which helped reduce their anxiety. These psychosocial benefits that appear to be an important component of CP that may also improve the quality of life for patients living alone has been observed with other CP programs in Canada[18] and the United States.[21] One study analyzing repeated ED use from patients' own perspectives at the Huddinge University Hospital in Sweden found that many patients revealed struggles with psychological and/or social problems that contributed to repeat ED visits.[42] Another study determined that unmet social needs were more often associated with repeat ED patients compared to patients with no ED visits.[43] Thus, the access to HV and WC services in our study, leading to increased opportunities for patients to socialize, could be a benefit that is also a protective and preventative factor related to a mental health. Future research could explore this assertion. Other CP-related research should also focus on exploring whether there are psychosocial benefits in other populations, geographies, and contexts. Finally, psychosocial benefits could be considered for inclusion in patient-centered care frameworks such as the PCCF. Clearly,

it appears that the CP program fosters patient-centered care for the patients in this study.

## 3.6 Conclusion

Participants enrolled in this study appear to show acceptance and appreciation towards the CP services that are available in their communities in rural and Northern Ontario. Many responses to the open-ended questions were reflective of the components of the PCCF and were indicative that the CP program may also foster patient-centered care in Northern Ontario. As previous research has indicated, rural and northern communities often have access to fewer health care services[10] that do not meet the needs of vulnerable populations, like an elderly population.[8, 11] By providing HVs and WCs, CP seemed to provide some patients with a viable alternative to calling dispatch for emergency services.[4] These CP services also seemed to improve access to care by making patients more supported and aware of other resources in their communities. As a result, it is becoming more evident that CP is capable of improving the overall physical and psychosocial aspects of patients' health. This was accomplished by creating a trusting paramedic-patient relationship, improving patients' self-management abilities and access to health care services, and ensuring that patients were more likely to have a sense of supportive independence in their own homes and community.

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# Chapter 4

## 4. Discussion

### 4.1 Overview

This thesis project consisted of two studies evaluating the utilization of community health services in rural and Northern Ontario. The first study was a case study involving the analysis of patient medical records from a rural hospital in Northern Ontario (Chapter 2). The second study was a cross-sectional observational investigation of patient perspectives related to CP, on a new model of health care (Chapter 3).

The purpose of the first study (Chapter 2) was to understand the reasons for repeat emergency department (ED) visits and multiple admissions in a rural hospital in north east (NE) Ontario. For patients with high ED utilization, dressing changes contributed to the greatest cause of repeat visits. The most frequent diagnosis for the repeat admission patients was chronic obstructive pulmonary disease (COPD) (33.1%; n=206), while chronic kidney disease (CKD) was the reason for highest number of inpatient days (30.8%; n=179). This study contributed to the literature focusing on causes related to frequent ED utilization,[1-3] especially from a small rural hospital perspective. We also found that pneumonia (2.9%; n=18) and urinary tract infections (2.9%; n=18) both

accounted for the seventh most frequent causes of repeat ED visits, while congestive heart failure (CHF) (26.3%; n=153) and COPD (17.2; n=100) were the second and third top reason for highest number of all inpatient days respectively. This study identified the most common reasons for repeat patient ED visits and repeat hospital admissions, and the findings led to a productive dialogue about optimizing health services to meet the needs of patients in one rural NE Ontario community. Specifically, this study led to the signing of a contract with the CCAC to increase home care services targeting dressing changes antibiotic treatments, dialogue to promote data-driven Health Links planning in the region, and an increase in patient referral for community paramedicine (CP) services.

The purpose of the second study (Chapter 3) was to compile patient perspectives related to their experiences with CP services initiated at several sites across rural and Northern Ontario. Most of the responses from the open-ended and quantitative data were positive related to the patients' experiences with the CP services that they received. All dimensions and almost all attributes of the Patient-Centered Care Framework (PCCF) were highlighted in the open-ended data. The findings suggested that the CP paramedics were regarded as trusting and attentive health professionals, taking the time to listen to their patients and understand their situations and conditions. The paramedics also acted as advocates for their patients by performing a patient-provider intermediary role that helped patients remain in contact with their physicians. The services that patients received also seemed to help improve self-management of health conditions by providing patients with the necessary information or resources needed to manage their conditions.

The versatility of CP services also improved access to care by providing patients with the opportunity to either receive health services through home visits (HV) or in the community at a wellness clinic (WC). Many of the patients also indicated that they no longer needed to rely on attending the ED or the clinic for non-urgent reasons and expressed the potential of CP for reducing clinic and ED wait times. The patients also revealed an important psychosocial aspect of the patient experience that was not included in any dimension of the PCCF. In this case, many patients mentioned that the CP program helped enhance social interactions during WCs. Patients also consistently expressed that knowing that a paramedic will eventually see them, or that they are being monitored, helped reduce anxiety, increased a sense of personal security, provided reassurance, and helped foster a peace of mind.

## 4.2 Importance of Patient-Centered Care and Patient Perceptions

It is anticipated that both studies will help contribute to the improvement of health care services provided in rural and Northern Ontario. The patient experience while interacting with health services was the focal point of this thesis through exploring reasons for frequent hospital utilization and seeking to understand patient perspectives related to their experience with CP services. The patient experience is often investigated through self-report surveys designed to seek perspective, feedback, and/or level of satisfaction. Patient satisfaction surveys have been frequently used to monitor and improve the quality of health care services,[4-6] and to suggest specific areas or services for quality improvement.[5]

Patient satisfaction has also been an effective method used to measure patients' perceptions of the quality of care and services they received.[7] In patient-centered care, the patient's preferences, objectives, and values should play a fundamental role in shared decision-making.[8] Thus, patient-centered care is often customized to respond to the needs, values, goals and preferences of each patient.[9]

By focusing on the patient experience, this thesis responded to the Ministry of Health and Long-Term Care (MOHLTC) reform on improving patient-centered care across Ontario. Beginning with the 2012 *Ontario's Action Plan for Health Care*[10] and continuing with the 2015 *Patients First: Action Plan for Health Care*[11] and the 2015 *Patients First – A Roadmap to Strengthen Home and Community Care*,[12] the MOHLTC has continuously called for a reform of patient-centered care in Ontario. This reform included a restructuring of the current health care system to effectively place patients at the center of the care that receive. The four key themes of access, connect, inform, and protect, that were highlighted in the 2015 *Patients First: Action Plan for Health Care*[11] document were one of the main focuses of this study.

By calling for a reform of the health care system, numerous recommendations were provided by the MOHLTC to improve patient-centered care. Based on the reports by the MOHLTC, fostering a patient-centered health care system meant utilizing various methods of technology, such as assistive devices and telemedicine, to improve access to health services and connect patients with specialists. These services would also assure

that the patients receive the right care from the right providers, particularly for those residing in rural areas. Another important factor at fostering patient-centered care would be to engage patients, stakeholders, and communities by providing opportunities to provide their perspectives on the care that they receive and the health care services that they access. This essential feedback can help identify important areas in need of improvement or highlight areas that are already successful. This feedback can also help foster a sustainable system by improving services or fostering new approaches. According to the MOHLTC strategy, Table 4-1 summarizes the outcomes of putting patients first. In a small localized way, this thesis helped investigate aspects of the patient experience that directly addressed each of these outcomes of putting patients first in our study populations in rural and northern regions.

**Table 4-1 - Outcomes of putting patients first**

| |
|---|
| Support Ontarians to make healthier choices and help prevent disease and illness. |
| Engage Ontarians on health care, so we fully understand their needs and concerns. |
| Focus on people, not just their illness. |
| Provide care that is coordinated and integrated, so a patient can get the right care from the right providers. |
| Help patients understand how the system works, so they can find the care they need when and where they need it. |
| Make decisions that are informed by patients, so they play a major role in affecting system change. |

Modified from: Ministry of Health and Long-Term Care. Ontario's action plan for health care. Toronto, ON: Queen's Printer for Ontario. 2012.

Although the CP perspectives study (Chapter 3) addressed most of the outcomes in Table 4-1, the hospital utilization study (Chapter 2) was singularly focused on understanding

the reasons for repeat visits in order to ensure patients get the right care from the right providers. Not surprisingly, many other EDs are subject to overcrowding that is caused by a small proportion of patients with repeat visit.[13-17] These repeat visits can also lead to increased wait times, delayed diagnosis and treatment, and occupied acute care beds.[13, 14] Hospitals also face the challenge of an aging population with a requisite increase in health care needs,[11] and older patients are known to be more likely to use ED services.[18-21] They also often have one or more chronic disease or condition[19] that could increase hospital readmission rates.[23-25] Thus, to offset the complications caused by rural health care access challenges and an aging population, new approaches, such as CP, must be developed to maximize the efficiency of health services in Ontario.[26]

Diverting high usage patients from the hospital to other community health care services may be a cost-effective approach for reducing hospital resource usage from repeat patients[2,26-30] and may also help reduce the amount of non-urgent emergency medical services (EMS) calls,[21,28-30] ED visits,[31,32] and hospital admissions.[33] Our hospital utilization study (Chapter 2) recommended several alternative health service options that could be used to divert repeat patients from the hospital. For future patients requiring multiple dressing changes or intravenous antibiotic treatments, it was recommended that these patients be referred to the local Community Care Access Center (CCAC) services (which are now part of the NE Local Health Integration Network), which is a more appropriate resource for their conditions.

Administrators from the hospital responded to this suggestion by executing an agreement with the local CCAC to provide referrals for treatment. A physician at the hospital also agreed to refer patients requiring dressing change and intravenous antibiotic treatments for CCAC services. It was also suggested that patients suffering from COPD, CHF, or diabetes mellitus would benefit from receiving remote patient monitoring (RPM) services to monitor their conditions since this could help better manage their conditions and potentially address some of the challenges surrounding access to specialists that is often seen in rural communities.[34-44] Hospital administrators also immediately responded to this suggestion by contacting patients, with a few patients agreeing to begin receiving RPM. By providing these alternative measures to divert patients from the ED, patients were more likely to receive care that is coordinated and integrated, so they could receive the right care from the right providers, which is consistent with previous literature.[30] As an alternative health care model, CP was also suggested to the hospital administrators. Patients that would be referred to CP would have the opportunity to receive scheduled HVs by paramedics or attend a monthly WC. Thus, this recommendation integrates with the focus of our second study (Chapter 3), which confirmed that, from a patient perspective, this alternative health care service was viable and effective.

The results from our second study (Chapter 3) appeared to address the four key objectives of the 2015 *Patients First: Action Plan for Health Care*. The patients in our study strongly felt that the CP services they received were improving their access to care by providing them with additional health care services through interactions with the CP

paramedics. They also felt more connected in their community by having the opportunity to socialize with other community members during the WCs and appreciated receiving additional information on available community resources. The CP program also helped inform patients about their current health status, improved their capacity for self-management of their conditions, and informed them of other health services available to them in their community. By addressing these first three key objectives of the 2015 *Patients First: Action Plan for Health Care*,[11] the CP programs were contributing to protecting the health system performance by creating more innovative approaches based on evidence, contributing more information available to the general public, and integrating patients in their own health care by providing them with patient-centered care. While it is known that the health of those residing in rural and northern communities in Ontario is poorer than the average Ontarian,[25,45] there is an opportunity for CP to be a sustainable service with the capability of improving health status and controlling costs, a recommendation that was suggested by the MOHLTC.[11]

By engaging patients in this study, it was also revealed that the CP paramedics seemed to take the time to understand their patients and see them as people, not just their illness. The CP paramedics also seemed to accept their role as health advocates for their patients assuring that they received the right care from the right providers and were aware of other resources that could help their health conditions. Since patients expressed many positive reviews of the CP services they received, there were few recommendations for improvements. However, patients elicited certain concerns about the program when they

heard of potential funding cuts. This was especially the case in the north west (NW) Ontario region, where the CP programs stopped for a short period of time due to lack of funding. It is important to note, that unlike a typical CP program that employs specialized paramedics trained in CP, these three CP programs utilize paramedics while on regular or modified duty,[46,47] a method that has been previously applied to other CP programs.[28] As mentioned in one of the original funding proposals, "the community paramedics will only work within their current scope of practice (and) they will work under the guidance and supervision of their employers and Base Hospital" (p18).[48] The proposal indicated that the use of on duty paramedics can also create the potential to decrease emergency response times by continuously roaming the community while delivering their services for CP.[48] As well, it was deemed that the dual role of on duty paramedics would not interfere with their ability to provide emergency response, since proper deployment plans would reflect the emergency priority.[48]

One other important aspect of the CP program was its unique inclusion criteria, which often included frequent users of EMS and hospital EDs. Since many EDs may be subject to overcrowding that is caused by a small proportion of patients with repeat visits,[13-17] it was meaningful to understand the reasons for these repeat visits and admissions. Hospitals also face the challenge of an aging population with a requisite increase in health care needs.[11] It has been previously shown that older patients are more likely to use ED services[18-21] and often have one or more chronic disease or condition[22] that could

increase hospital readmission rates.[23-25] Therefore, it can be suggested that the continued implementation of the CP programs can potentially decrease hospital readmission rates.

## 4.3 Limitations

Since chapters 2 and 3 focused on two separate studies, limitations differed between each study, however many of these limitations are also opportunities for future research. The findings of both papers are limited to the hospital and pilot communities studied and may not be generalizable to other small hospitals or communities.

The study focusing on hospital utilization (Chapter 2) did not account for diagnosis clarity or overlap in diagnoses, since the International Classification of Diseases, Tenth Revision, (ICD-10-CM)[49] coding was not used consistently, leading to the likelihood of misclassification or lack of precision in classification. For instance, some patients may have visited the ED for dressing changes as the recorded reason, but this may have been related to dressing changes to address diabetic foot ulcerations. While utilization of hospital resources (such as prescription or diagnostic imaging services) or the impact of frequent users on ED wait times are important variables,[50] this study did not evaluate how the diversion of patients to alternative health care services affected these variables. As well, our study was unable to differentiate between physician-directed ED visits and patient-initiated ED visits. In other words, some patients may have been directed by their physician to visit the ED. This nuance is important because it is possible that many of the

visits could have been due to a follow-up that would have been better addressed by an alternative service in the community. However, knowing who initiated or directed the visit could influence whether the alternative service is actually utilized. Additionally, cost comparisons were not addressed in this study.

There were several limitations related to the study of the patient's perspectives on CP (Chapter 3). One of the most concerning issues was the imbalance of service components (HV and WC) between the geographic regions, where the majority of WC patients were in the NE Ontario, and nearly all HV patients were in the NW Ontario. This limited our ability to interpret comparisons of self-reported health between services (HV vs. WC) or between regions (NE vs. NW). Additional limitations included an overall small study sample despite good response rates, which was likely due to the complex recruitment process. The total population of CP patients in Northern Ontario was unknown since the patient tracking system used by the EMS providers was inconsistently used and ineffective at compiling credible data at the time of the study. There was also the possibility of a participation bias where some patients were unable to complete the survey due to a physical or cognitive disability, or the paramedics did not distribute the surveys to patients who they felt would not be able to compete the survey or who they perceived would have provided negative responses. Additionally, the CP programs in Northern Ontario were fairly new, and some patients had limited exposure with the services, which may have impacted the accuracy and credibility of their responses.

Other limitations related the CP study was the loss of MOHLTC funding which halted the program in NW Ontario for a short period during the time of the study and this could have had an impact on patient responses. This study also did not evaluate systemic implications related to frequency of calls to EMS, number of hospital ED visits or repeat admissions, or economic impact.

## 4.4 Implications

Despite the limitations, there are several implications related to the two studies included in this thesis. The hospital utilization study (Chapter 2) revealed that in one community in rural and Northern Ontario, non-urgent issues like repeat dressing changes were the main contributor to repeat ED visits, while many of the repeat admissions were caused by chronic conditions such as COPD, CHF, or CKD. The implications of this study were clear in terms of providing hospital administrators with specific options and recommendations for referral to alternative health care services for some patients. For instance, some non-urgent cases could be diverted from the ED and referred to CP. As well, patients with chronic conditions such as COPD, CHF, and CKD, may be monitored with weekly visits through CP or may be referred to RPM since this could help better manage their conditions and potentially address some of the challenges surrounding access to specialists that is often seen in rural communities.[34-44] Thus, determining specific causes of increased hospital resource usage may benefit other small hospitals by providing an example of a process (method) and a reference data set for comparison. In

summary, direct implications of this study included: increased referrals to the CP program and RPM, data-driven Health Links planning in the region, and the signing of a contract with the CCAC to increase home care services targeting dressing changes and antibiotic treatments.

However, there could be potential negative implications when attempting to reduce frequent ED visits and hospital admissions resulting in adverse events for some patients. A study by Raven et al.[51] identified 38 studies of ED visit reduction programs conducted throughout the United-States and did not find any evidence of an increase in adverse events, including an increase in hospitalization rates or mortality from the interventions. However, they were unable to draw definitive outcomes about effectiveness for the majority of the programs, leading to the conclusion that ED visit reduction programs will need to be more rigorously investigated.[51]

The CP perspectives study (Chapter 3) provided encouraging early signs that from an elderly patient perspective, CP is an acceptable and accessible program that appears to be helping improve the patient experience in communities across Northern Ontario. It is also important to know that one of the key implications of this model of CP is that it uses on-duty paramedics, and this implies overall system efficiency and cost effectiveness.

As previous research indicated, rural and northern communities often have access to fewer health care services[52] that do not meet the needs of vulnerable populations, such as

the elderly population.[53,54] The patient perspectives of the CP program provided stakeholders with valuable information that may be used to make the program more efficient, while also striving to improve acceptability and accessibility, two important features of a patient-centered health care system. The patient responses revealed that they were satisfied with their involvement in HVs and WCs, suggesting that the patients were benefiting from these services. Although not investigated directly, there is also an implication that CP services provided patients with an alternative to calling dispatch for EMS[55] and relying less on attending the ED for non-urgent issues.[21,28-33]

There could also be some negative implications caused by the CP program, particularly with the use of on-duty paramedics. From a CP patient perspective, concerns were raised when paramedics had to leave a WC when paramedics needed to respond to an emergency call. However, the majority of patients seemed to understand the obligation to prioritize emergency calls. As well, there is a possibility of delaying emergency services due to the removal of paramedics from their discharge-base while doing home visits or attending wellness clinics. To reduce this negative implication, it was deemed that the dual role of on duty paramedics would not interfere with their ability to provide emergency response, since proper deployment plans would reflect the emergency priority.[48]

## 4.5 Conclusion

Overall, both of these studies responded to the MOHLTC reform on patient-centered care. It has been seen that many patients present to the ED for non-urgent issues. These issues could potentially be addressed by alternative health care services found in the community. Our studies found that an older population with increased health needs appear acceptable towards receiving alternative health care services outside of the hospital. Based on the perspectives of patients currently enrolled in CP programs across Northern Ontario, the HV and WC services of CP appeared to be considered as an acceptable program that can provide patient-centered care in rural and northern communities. In the communities with pilot CP programs, patients were able to access additional health care services at no cost and they had an alternative to calling EMS. Increasing these types of health services in rural communities appears to be an appropriate way of improving patient access to alternative medical services while ameliorating their physical and psychosocial health needs. These are encouraging signs that alternative health care services, like the CP programs, can address non-urgent issues for residents of northern and rural communities in Ontario.

Future studies could: (1) determine whether the quality of care improved for any of the patients from our study who were diverted to alternative care services in the community; (2) if there are any utilization changes in terms of ED visits and hospital admissions; (3) if CP programs reduce morbidity and mortality; and (4) should involve economic evaluation and EMS utilization of this type of CP program to determine if there are cost

savings related to a reduced number of calls to EMS or visits to local EDs. Other small rural hospitals could benefit from initiating similar data-driven quality improvement initiatives in order to optimize health care services for the communities they service.

It is also known that those living in rural and northern communities across Northern Ontario, Canada must overcome many challenges when accessing health care services. For many people residing in rural and northern communities in Ontario, a hospital is their primary source of health care services, however these services may often be misused.[57] Thus, the health care system in rural and Northern Ontario will need alternative services, such as CP, to reduce non-urgent ED visits and ensure patients have access to other health care services available in their community.[57] These innovative alternatives are a hallmark of patient-centered care that are applied to a rural and northern context.

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# Appendices

## Appendix A - Ethics approval for Utilization of a rural hospital in Ontario, Canada: Understanding reasons for repeat emergency department visits and multiple admissions over a fifteen-month period

LaurentianUniversity
UniversitéLaurentienne

**APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS**
Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

| TYPE OF APPROVAL / New X / | Modifications to project / Time extension |
|---|---|
| **Name of Principal Investigator and school/department** | Chad Prevost, Centre for Rural & Northern Health, supervisors S. Ritchie, J. Sherman |
| **Title of Project** | Case Study of Repeat Emergency Department Visits and Hospitalizations in a Small Rural Hospital in Northern Ontario |
| **REB file number** | 6009551 |
| **Date of original approval of project** | October 28, 2016 |
| **Date of approval of project modifications or extension *(if applicable)*** | |
| **Final/Interim report due on:** *(You may request an extension)* | October 28, 2017 |
| **Conditions placed on project** | |

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g. you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Rosanna Langer

Rosanna Langer, PHD, Chair, *Laurentian University Research Ethics Board*

## Appendix B - Patient Questionnaire

# PATIENT QUESTIONNAIRE
## COMMUNITY PARAMEDICINE PROGRAM

**Instructions to Survey Participants**

- The purpose of this survey is to learn about the services and care you have received from paramedics at a Wellness Clinic or during home visits related to the Community Paramedicine program. Community paramedicine simply refers to non-emergency medical follow-up and planned visits by paramedics rather than visits by emergency ambulance services that result from dialing 911.
- To respond to each question or statement, please mark the box (☐ or ☐) by the answer that reflects who you are, or is closest to the way you feel about the community paramedicine services and care provided to you. There are also a few questions requiring additional short answer written responses. The entire survey should take you 15-20 minutes to complete.
- Please do not include any personal information in your responses (e.g. names) that can identify yourself.

**DATE:**_____

**PART A**

1. **Since you first started meeting paramedics at a wellness clinic or during a home visit, please indicate if you…**

   **a.** Met with a paramedic at a Wellness Clinic: ☐ Yes ☐ No

   If yes, how many times? ☐ 1-2 ☐ 3-5 ☐ 6-10 ☐ 11 or more

   **b.** Met with a paramedic who visited you at home for a medical follow-up: ☐ Yes ☐ No

   If yes, how many times? ☐ 1-2 ☐ 3-5 ☐ 6-10 ☐ 11 or more

2. **Where do you live, or what place is the closest to where you live?**

   ☐ Gore Bay ☐ Gogama ☐ Richard's Landing ☐ White River

   ☐ Smooth Rock Falls ☐ Hearst ☐ Other

   If "Other", please specify: _____

3. **Which of the following best describes your living situation:**

   ☐ At home alone ☐ At home with family or friend(s)

   ☐ At a facility that provides care ☐ Other

   If "Other", please specify: _____

4. **In what year were you born?** _____ ☐ Prefer not to answer

5. **What is your sex:** ☐ Male ☐ Female ☐ Other ☐ Prefer not to answer

6. **What is your preferred language:** ☐ English ☐ French ☐ Other
   If "Other", please specify: _____

7. **Were the paramedic(s) able to communicate in the language you prefer?**
   ☐ Yes ☐ No ☐ Somewhat

8. **If you had more than one home visit from a paramedic(s), did you have the same paramedic(s) during each home visit?**
   ☐ Yes ☐ No ☐ Do not know ☐ Not applicable / no home visits

9. **Since your first visit with community paramedics, have you also received home visits from another health or support service?**
   a. ☐ Yes ☐ No ☐ Do not know ☐ Not applicable / no home visits

   b. **If "Yes", select all those organizations or professionals who provided home visits to you:**
   ☐ Community Care Access Centre ☐ Red Cross ☐ Victorian Order of Nurses
   ☐ Nurse/Nurse Practitioner ☐ Physician ☐ Other
   If "Other", please specify: _____

10. **In general, would you say that your health is:**

| Excellent | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

11. **In general, would you say that your <u>mental</u> health is:**

| Excellent | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**12. Since you <u>first started</u> meeting paramedics at a wellness clinic or during a home visit:**

**a) Have you been seen in the Emergency Department of the hospital?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**b) Have you been admitted to the hospital for at least one night?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many nights? ☐ 1 ☐ 2-3 ☐ 4 or more

**c) Have you used 911 ambulance service for transportation to the hospital?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**d) Have you or someone in your household called 911 for your health?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**e) If you answered yes to question 12c or d above, what was the reason for the most recent 911 ambulance call related to your health?**

☐ Reason: _____

☐ Not applicable ☐ Do not remember ☐ Prefer not to answer

**13. Think about the last time you were involved in the Community Paramedicine program, either at a Wellness Clinic or during a home visit. What would you have done if you had not gone to a Wellness Clinic or been visited at home by a paramedic? [Check any that may apply]**

☐ Nothing ☐ Used 911 services ☐ Called a doctor ☐ Called Telehealth

☐ Visited a clinic ☐ Visited a health centre ☐ Visited a hospital ☐ Other

If "Other", please specify: _____

**PART B**

***Community paramedicine refers to a non-emergency, community-based service conducted by paramedics with a focus on health education and promotion, illness management, injury prevention, and referral to other health services. For each of the following statements or questions, select the best response (answer) based on your opinion or how you feel.***

**14. The paramedic(s) helped me learn how to better manage my own health.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**15. I am more confident that I can manage my health at home because of the community paramedicine program.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**16. I learned about other health and social services in my area from the paramedic(s).**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**17. The paramedic(s) helped refer me to another health or social service that I needed.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**18. The paramedic(s) listened to my concerns.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**19. The paramedic(s) took the time to answer my questions.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**20. I did not understand the paramedic(s) answers and explanations.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**21. The paramedic(s) treated me with respect, dignity, and compassion.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**22. I get more frequent medical follow-ups now, because of the paramedics at the Wellness Clinic or the paramedics who visit me at home.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**23. I do not need to go to the doctor or hospital as often now, because of the community paramedicine program.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**24. I do not trust the paramedic(s), I would rather have a home visit from a doctor or nurse.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**25. The community paramedicine program makes me feel more supported and connected in my community.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**26. The community paramedicine program is addressing a gap in health care services in my community.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**27. Overall, how satisfied are you with the services and care provided by the community paramedic(s)?**

| Very satisfied | Satisfied | Dissatisfied | Very dissatisfied | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**28. Right now, community paramedicine is a pilot project in this region with only a few paramedics involved. Do you agree that more paramedics should be allowed to make home visits and offer wellness clinics in other regions across Ontario?**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**29. Would you recommend this community paramedicine service to others?**

| Yes | No | |
|---|---|---|
| ☐ | ☐ | **Please comment**: _____ |

_____

**Part C**

***Considering your experiences at a Wellness Clinic or during a home visit from a paramedic(s), please share your thoughts on the following questions. If you've had a home visit, please also consider any assessments that the paramedics performed (Timed Up to Go Mobility Test, Falls Risk Assessment, Mini Mental State Exam, Independent Living Assessment, etc.).***

**1. What do you like about the community paramedicine program?**

**2. What do you dislike about the community paramedicine program?**

**3. Do you have suggestions for how to improve the community paramedicine program?**

**4. Do you have any other comments?**

***THANK YOU FOR PARTICIPATING IN THIS SURVEY! THERE ARE THREE WAYS YOU CAN RETURN THE COMPLETED SURVEY: (1) FAX: 1-855-512-4321; (2) SCAN & E-MAIL: cpstudy@laurentian.ca; (3) CANADA POST: Use the self-addressed envelope provided.***



FOR OFFICE USE ONLY:

Date received:_____

## Appendix C - Caregiver Questionnaire

# CAREGIVER QUESTIONNAIRE
## COMMUNITY PARAMEDICINE PROGRAM

**Instructions to Survey Participants**

- The purpose of this survey is to learn about the services the patient you care for has received from paramedics at a Wellness Clinic or during home visits related to the Community Paramedicine program. The term "patient" is used to refer to the person both you and the paramedics cared for. Community paramedicine simply refers to non-emergency medical follow-up and planned visits by paramedics rather than visits by emergency ambulance services that result from dialing 911.
- To respond to each question or statement, please mark the box (☐ or ☐) by the answer that reflects who you are, or is closest to the way you feel about the community paramedicine services received by the patient you care for. There are also a few questions requiring additional short answer written responses. The entire survey should take you 15-20 minutes to complete.
- Please do not include any personal information in your responses (e.g. names) that can identify yourself.

**DATE: _____**

**Which of the following best describes your relationship to the patient?**

☐ Spouse ☐ Family member

☐ Friend ☐ Health care professional

☐ Other:_____

**PART A**

1. **Since the patient first started meeting with paramedics at a wellness clinic or during a home visit, please indicate if they…**
   - **a.** Met with a paramedic at a Wellness Clinic: ☐ Yes ☐ No
     If yes, how many times? ☐ 1-2 ☐ 3-5 ☐ 6-10 ☐ 11 or more
   - **b.** Met with a paramedic who visited them at home for a medical follow-up: ☐ Yes ☐ No
     If yes, how many times? ☐ 1-2 ☐ 3-5 ☐ 6-10 ☐ 11 or more

2. **Where does the patient live, or what place is the closest to where he/she lives?**

☐ Gore Bay ☐ Gogama ☐ Richard's Landing ☐ White River

☐ Smooth Rock Falls ☐ Hearst ☐ Other

If "Other", please specify: _____

3. **Which of the following best describes the patient's living situation:**

☐ At home alone ☐ At home with family or friend(s)

☐ At a facility that provides care ☐ Other

If "Other", please specify: _____

4. **In what year was the patient born?** _____ ☐ Prefer not to answer

5. **What is the patient's sex:** ☐ Male ☐ Female ☐ Other ☐ Prefer not to answer

6. **What is the patient's preferred language:** ☐ English ☐ French ☐ Other
If "Other", please specify: _____

7. **Was the paramedic(s) able to communicate in the patient's preferred language?**

☐ Yes ☐ No ☐ Somewhat

8. **If the patient had more than one home visit from a paramedic, did he/she have the same paramedic(s) during each home visit?**

☐ Yes ☐ No ☐ Do not know ☐ Not applicable / no home visits

9. **Since the patient's first visit with community paramedics, did he/she also receive home visits from another health or support service?**

   a. ☐ Yes ☐ No ☐ Do not know ☐ Not applicable / no home visits

   b. **If "Yes", select all those organizations or professionals who provided home visits to the patient:**

   ☐ Community Care Access Centre ☐ Red Cross ☐ Victorian Order of Nurses

   ☐ Nurse/Nurse Practitioner ☐ Physician ☐ Other

   If "Other", please specify: _____

**10. In general, would you say that the patient's health is:**

| Excellent | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**11. In general, would you say that the patient's <u>mental</u> health is:**

| Excellent | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**12. Since the patient has <u>first started</u> meeting paramedics at a wellness clinic or during a home visit:**

**a) Has he/she been seen in the Emergency Department of the hospital?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**b) Has he/she been admitted to the hospital for at least one night?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many nights? ☐ 1 ☐ 2-3 ☐ 4 or more

**c) Has he/she used 911 ambulance service for transportation to the hospital?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**d) Has he/she or someone in their household called 911 for their health?**

Yes No Do not know

☐ ☐ ☐ If "Yes", how many times? ☐ 1 ☐ 2-3 ☐ 4 or more

**e) If you answered yes to question 12c or d above, what was the reason for the most recent 911 ambulance call related to the patient's health?**

☐ Reason: _____

☐ Not applicable ☐ Do not remember ☐ Prefer not answer

**13. Think about the last time the patient was involved in the Community Paramedicine program, either at a Wellness Clinic or during a home visit. What would you have done for him/her if he/she had not gone to a Wellness Clinic or been visited at home by a paramedic? [Check any that may apply]**

☐ Nothing ☐ Used 911 services ☐ Called a doctor ☐ Called Telehealth

☐ Visited a clinic ☐ Visited a health centre ☐ Visited a hospital ☐ Other

If "Other", please specify: _____

**PART B**

***Community paramedicine refers to a non-emergency, community-based service conducted by paramedics with a focus on health education and promotion, illness management, injury prevention, and referral to other health services. For each of the following statements or questions, select the best response (answer) based on your opinion or how you feel in your role as a caregiver.***

**14. The paramedic(s) helped me learn how to better manage the patient's health.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**15. I am more confident that I can manage the patient's health at home because of the community paramedicine program.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**16. I learned about other health and social services in my area from the paramedic(s).**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**17. The paramedic(s) helped refer the patient to another health or social service that they needed.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**18. The paramedic(s) listened to the concerns of the patient.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**19. The paramedic(s) took the time to answer the questions of the patient.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**20. I did not understand the paramedic(s) answers and explanations.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**21. The paramedic(s) treated the patient with respect, dignity, and compassion.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**22. The patient gets more frequent medical follow-ups now, because of the paramedic(s) at the Wellness Clinic or the paramedic(s) who visit the patient at home.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**23. The patient does not need to go to the doctor or hospital as often now, because of the community paramedicine program.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**24. I do not trust the paramedic(s), I would rather have a doctor or nurse visit the patient at home.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**25. I believe that the community paramedicine program makes the patient feel more supported and connected in their community.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**26. The community paramedicine program is addressing a gap in health care services in the patient's community.**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

***27.* Overall, how satisfied are you with the services and care provided to the patient by the community paramedic(s)?**

| Very satisfied | Satisfied | Dissatisfied | Very dissatisfied | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**28. Right now, community paramedicine is a pilot project in this region with only a few paramedics involved. Do you agree that more paramedics should be allowed to make home visits and offer wellness clinics in other regions across Ontario?**

| Strongly agree | Agree | Disagree | Strongly disagree | Not applicable/Do not know |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

**29. Would you recommend this community paramedicine service to others?**

Yes ☐ No ☐ **Please comment**: _____

_____

**Part C**

***Considering your experiences accompanying a patient at a Wellness Clinic or during a home visit from a paramedic(s), please share your thoughts on the following questions. If you've been present during a home visit, please also consider any assessments that the paramedics performed (Timed Up to Go Mobility Test, Falls Risk Assessment, Mini Mental State Exam, Independent Living Assessment, etc.).***

**1. What do you like about the community paramedicine program?**

**2. What do you dislike about the community paramedicine program?**

**3. Do you have suggestions for how to improve the community paramedicine program?**

**4. Describe how the community paramedicine program affected you in your role as a caregiver:**

***THANK YOU FOR PARTICIPATING IN THIS SURVEY! THERE ARE THREE WAYS YOU CAN RETURN THE COMPLETED SURVEY: (1) FAX: 1-855-512-4321; (2) SCAN & E-MAIL: cpstudy@laurentian.ca; (3) CANADA POST: Use the self-addressed envelope provided.***



FOR OFFICE USE ONLY:

Date received:_____

## Appendix D - Consent to be Contacted Form

LaurentianUniversity
UniversitéLaurentienne

Centre for Rural and Northern Health Research
CRaNHR
Centre de recherche en santé dans les milieux ruraux et du nord

**CONSENT TO BE CONTACTED**
**FOR RESEARCH ON COMMUNITY PARAMEDICINE**

**STUDY TITLE: Patient and Caregiver Perspectives on Community Paramedicine in Algoma, Cochrane, and Manitoulin-Sudbury Districts**

The purpose of this study is to understand patient and caregiver experiences with the community paramedicine (CP) program. Community paramedicine simply refers to checkups and scheduled visits by paramedics, rather than visits by emergency ambulance services that result from dialing 911. Survey results will be used to evaluate and improve the program.

We are inviting all clients – either patients or caregivers – to participate in the survey. Participation in this study is voluntary, and it will have no impact on the services you receive from the community paramedicine program. There is no obligation for you to participate, however your perspective would really help us evaluate and improve the effectiveness of this new health service (community paramedicine).

If you think you might like to participate in the survey and would like more information, please provide your contact information below. **The research team will contact you in 3-6 months after we receive your contact information.**

---

First Name: _____ Last Name: _____

Address: _____ Town/City: _____

Province: _____ Postal Code: _____

Tel. #: _____ E-mail: _____

I prefer to be contacted by: □ **e-mail** □ **regular mail** (Canada Post) □ **telephone**

Best day & time to call? Day of the week: _____ Time: _____

I am a: □ patient or client □ caregiver to the patient or client

Preferred language for the survey: □ English □ French

I am 18 years or older and have read and understand all the information on this form. I consent to be contacted for this research.

_____ _____

Signature of participant Date (DD/MM/YYYY)

Please place the completed form in the self-addressed and stamped envelope to mail back to the research team. Alternatively, if you have any questions, you may contact Stephen Ritchie, PhD; Tel: 1-800-461-4030, Ext. 1046; Fax 1-855-512-4321 Email: cpstudy@laurentian.ca.

## Appendix E - Ethics Approval for Patient experiences related to community paramedicine programs in Northern Ontario, Canada


**APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS**
Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

| TYPE OF APPROVAL / New / Modifications to project X / Time extension X | |
|---|---|
| **Name of Principal Investigator and school/department** | Stephen Ritchie, Jim Little, Human Kinetics, Kayla Gallo, NOSM, Jill Sherman, Chad Prevost, CRaNHR |
| **Title of Project** | Experiences of Patients and Caregivers Involved in a Community Paramedicine Program in Northern Ontario |
| **REB file number** | 2015-02-06 |
| **Date of original approval of project** | March 9, 2015 |
| **Date of approval of project modifications or extension *(if applicable)*** | March 22, 2016 |
| **Final/Interim report due on:** *(You may request an extension)* | March 2017 |
| **Conditions placed on project** | |

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g. you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Rosanna Langer

Rosanna Langer, PHD, Chair, *Laurentian University Research Ethics Board*